

THE OHIO STATE UNIVERSITY

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Friday, June 2, 2023

The Ohio State University  
Fawcett Center

# Mallory-Coleman/ Columbus Orthopaedic Research Day



**THE OHIO STATE UNIVERSITY**  
WEXNER MEDICAL CENTER



MOUNT CARMEL



**OhioHealth**

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## SCHEDULE

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- 8:30 am      **Welcome from Dr. Andrew Glassman, Chair**
- 8:35 am      **Introduction of Visiting Professor and Moderator, Carol Morris, MD, MS**  
By Joel Mayerson, MD
- 8:40 am      **Remarks/Overview of the Event**  
Steven Lavender, PhD, and Nathaniel Bates, PhD, Conference Chairs
- 8:45 am      **Podium Presentations Session 1: Order of presentations is as follows:**  
  
Kenan Alzouhayli, MD Candidate, OSU Class of 2024  
Hannah Harris, MD, PGY2 Orthopaedic Resident  
Daniel Li, MD, PGY4 Orthopaedic Resident  
Thomas J. Utset-Ward, MD, Musculoskeletal Oncology Fellow  
Christian Curatolo, MD, PGY3 Orthopaedic Resident
- 9:45 am      **Poster Session (Franklin and Hamilton Rooms)**
- 10:35 am     **Podium Presentations Session 2: Order of presentations is as follows:**  
  
Thomas J. Utset-Ward, MD, Musculoskeletal Oncology Fellow  
Kenan Alzouhayli, MD Candidate, OSU Class of 2024  
Nicholas Walla, MD, PGY5 Orthopaedic Resident  
Tyler Ames, MD, Adult Reconstructive Orthopaedics Fellow  
Mia Qin, MD, Hand & Upper Extremity Fellow
- 11:35 am     **Visiting Professor Presentation**  
*“Effects of Cancer Treatment on the Musculoskeletal System: The Price of Success”*  
Carol Morris, MD, MS
- 12:30 pm     **Wrap-Up And Final Remarks**  
Steven Lavender, PhD, Nathaniel Bates, PhD, and Andrew Glassman, MD
- 1235 pm      **Lunch (Club Room)**

## **MALLORY- COLEMAN/COLUMBUS ORTHOPAEDIC RESEARCH DAY**

This research day was established to encourage the development of ideas related to research in orthopaedic surgery and related basic sciences.

Each year, a distinguished visiting professor is invited to moderate the resident presentations while providing constructive criticism and commentary.

### **Past Visiting Professors:**

2022 Kurt Spindler, MD  
2020 Todd Albert, MD  
2019 Heather Vallier, MD  
2018 Joshua Jacobs, MD  
2017 Tamara Rozental, MD  
2016 Julie Switzer, MD  
2015 Javad Parvizi, MD  
2014 Leesa Galatz, MD  
2013 Howard An, MD  
2012 Regis O'Keefe, MD  
2011 Henrik Malchau, MD  
2010 Freddie Fu, MD  
2009 James Heckman, MD  
2008 Cato Laurencin, MD  
2007 William Garrett, MD  
2006 Peter Stern, MD  
2005 James Goulet, MD  
2004 Steven Arnoczky, DVM  
2003 Joseph Buckwalter, MD  
2002 Victor Goldberg, MD  
2001 James Urbaniak, MD  
2000 Douglas Jackson, MD  
1999 Douglas Dennis, MD  
1998 Thomas Einhorn, MD  
1997 Larry S. Matthews, MD  
1996 Gary Friedlander, MD  
1995 James Herndon, MD  
1994 Clement B. Sledge, MD  
1993 Eric L. Radin, MD



**2023 MALLORY-COLEMAN  
VISITING PROFESSOR AND  
MODERATOR:**

**CAROL MORRIS, MD, MS**

Dr. Carol Morris is Chief of the Orthopaedic Surgery Service and the Jack Byrne Chair for Adolescent and Young Adult Cancers at the Memorial Sloan Kettering Cancer Center (MSKCC). She completed her undergraduate and graduate studies at the Massachusetts Institute of Technology (BS '87, MS '90) where her thesis concentration was on bone tissue engineering. She received her MD degree from Boston University ('94) and continued on at Boston University for Orthopaedic Surgery residency training. She subsequently pursued a fellowship in musculoskeletal oncology at the Memorial Sloan Kettering Cancer Center (MSKCC).

Following fellowship, she joined the faculty at MSKCC and Cornell University School of Medicine where she remained on staff for 13 years. During her tenure there, she served as the musculoskeletal oncology fellowship director. In 2014, she moved to Johns Hopkins Medicine where she served as Chief of Orthopaedic Oncology and Vice Chair of the Department of Orthopaedic Surgery prior to returning to MSKCC in 2022. She maintains a busy clinical practice treating adult and pediatric patients with bone and soft tissue tumors of the extremities and pelvis.

Dr. Morris' scholarly contributions include over 170 peer reviewed publications and chapters primarily on bone and soft tissue sarcomas, skeletal metastases, and complex limb salvage. Her translational research interests include late effects of cancer treatment on the musculoskeletal system. She has received several teaching awards for her educational efforts. She serves as the co-Director of the AAOS ROCK. Dr. In addition, Morris holds leadership positions in several national and international professional societies and is currently Past President of the Musculoskeletal Tumor Society.

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## **Podium Presentations**

### **Session 1: 8:45–9:45 am: Order is as follows:**

**Kenan Alzouhayli, BA**

*“Distal Radius Fracture Subsidence After Nonoperative Treatment”*

**Hannah Harris, MD**

*“Treatment of Isolated Distal Ulna Fractures: A 10-Year Retrospective Review”*

**Daniel Li, MD**

*“Effect of Tranexamic Acid on Post-Operative Pain and Function after Total Joint Arthroplasty”*

**Thomas J. Utset-Ward, MD**

*“Metastatic Bone Disease: Is Treatment at an Academic Cancer Center or High-Volume Center Associated with Improved Survival”*

**Christian Curatolo, MD**

*“Immediate Weight Bearing after Modified-Brostrom Reconstruction: A Retrospective Review of an Accelerated Rehab Protocol”*

### **Session II: 10:35 - 11:35: Order is as follows:**

**Thomas J. Utset-Ward, MD**

*“Optical Coherence Tomography for Surgical Margin Assessment in Soft Tissue Sarcoma”*

**Kenan Alzouhayli, BA**

*“Operative Efficiency and Complications Following Release of the Short External Rotators During the Direct Anterior Approach to Total Hip Arthroplasty”*

**Nicholas Walla, MD**

*“Reliability of Visual Assessment and Identification of Risk Factors for a Large J-sign in Patellar Instability”*

**Tyler Ames, MD**

*“Outcomes Following Total Joint Arthroplasty in Patients with a Colostomy”*

**Mia Qin, MD**

*“Outcomes Following Surgical Denervation of the Thumb Carpometacarpal Joint for Osteoarthritis”*

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## **Poster Presentations**

**Session: 9:45–10:10 am:** All posters will be presented in the Hamilton and Franklin Rooms at the Fawcett Center

**Paul Alvarez, MD - Poster #1**

*“Deformity Considerations After Cervical Laminoplasty: A Systematic Review”*

**Connor Hoge, MD - Poster #3**

*“What Psychological Factors Impact Return to Sports Following Surgical Intervention for Shoulder Instability? A Systematic Review”*

**Erryk Katayama, BS - Poster #5**

*“Comparison of Functional Post-Operative Outcomes in Traumatic and Nontraumatic Arthroscopic Rotator Cuff Repairs”*

**Scott Hyland, DO - Poster #7**

*“Posterolateral Femoral Episiotomy for Explantation: Case Report”*

**Azeem Malik, MD - Poster #9**

*“Inter-Specialty Variation in Peri-Operative Healthcare Resource Utilization for Carpal Tunnel Release”*

**Parker Prusick, MD - Poster #11**

*“Cervical Total Disc Replacement: A 10-year Single-Center Experience”*

**Harish Chinnasamy, BS - Poster #13**

*“Presence of Concomitant Osteochondral Lesions of the Talus in Anterior Talofibular Ligament Injuries: A Retrospective Review”*

**Thomas J. Utset-Ward, MD - Poster #15**

*“Improving Outcomes of Intercalary Allograft Reconstructions With Patient-Specific Instrumentation and Virtual Surgical Planning”*

**Thomas J. Utset-Ward, MD - Poster #17**

*“Is there a Role for Radiation Therapy in the Treatment of Small Intermediate and High-Grade Soft Tissue Sarcomas of the Extremities?”*

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## **Poster Presentations**

**Session: 10:10 - 10:35 am:** All posters presented in the Hamilton and Franklin Rooms at the Fawcett Center

**John Barnett, BS - Poster #2**

*“The COVID-19 Pandemic and Arthroscopic Rotator Cuff Repair: Were Surgical Outcomes Negatively Affected?”*

**Daniel DeGenova, DO - Poster #4**

*“Talar Neck Fracture with Medial Bone Void Treated with Cervical Spine Allograft”*

**Scott Hyland, DO - Poster #6**

*“Outcomes of MPFL Reconstruction Utilizing Allograft Technique in an Adolescent/Pediatric Population”*

**George Durisek, BS - Poster #8**

*“Analysis of Shoulder Arthroplasty in Patients With a Prior Solid Organ Transplant”*

**Joseph Long, MD - Poster #10**

*“Outcomes for an Alternative Technique of In-situ Screw Fixation in Nondisplaced Femoral Neck Fractures”*

**Tucker Peabody, DO - Poster #12**

*“Association Between Pronation External Rotation IV Fracture Pattern and Regional Bone Density”*

**David Pettit, MD - Poster #14**

*“Orthopaedists' Paths to the NFL Sideline: A Review of Professional Team Physician Training”*

**Thomas J. Utset-Ward, MD - Poster #16**

*“Breaking Convention: No difference in Local Recurrence Resecting Biopsy Tract and Primary Sarcoma Separately”*

**Seth Wilson, BS - Poster #18**

*“How Were Anatomic Total Shoulder Arthroplasty Outcomes Affected by the COVID-19 Pandemic?”*

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# PODIUM PRESENTATIONS

8:45 AM - 9:45 AM

*AND*

10:35 AM - 11:35 AM

CLINTON ROOM



*Kenan Alzouhayli, BA is a 4th Year Medical Student at the Ohio State University College of Medicine*

## **DISTAL RADIUS FRACTURE SUBSIDENCE AFTER NONOPERATIVE TREATMENT**

Authors: Kenan Alzouhayli, BA, Richard Samade, MD, PhD, Beau Sitton, BS, Nathaniel Bates, PhD, Kanu S. Goyal, MD

Presenter: Kenan Alzouhayli, BS

### **INTRODUCTION:**

Distal radius fractures (DRFs) are the most common orthopedic fractures in the Western world.<sup>1</sup> Radiographic characteristics have been studied to predict stability and good function after the treatment of DRFs.<sup>2</sup> Fracture migration leading to changes in radial height (RH), ulnar variance (UV), volar tilt (VT), and radial inclination (RI) outside of normal parameters can result in subsidence. The objectives of this study were to understand subsidence progression after nonoperative DRF treatment and identify some risk factors.

**Hypothesis:** There is no significant association between the incidence of subsidence following nonoperative DRF treatment and fracture characteristics or initial injury management.

### **METHODS:**

This is a retrospective cohort study of patients treated by 8 hand surgeons at OSUMC between 2008-2018. Patients were identified using ICD-9 and -10 codes denoting a diagnosis of DRF. IRB protocol number: 2019H0240.

Patients over the age of 18 years old who were treated nonoperatively were included. Exclusion criteria included < 84 days of follow-up data of initial evaluation and incomplete PA and lateral radiographs at the time of injury.

102 nonoperative DRFs were identified, 76 met inclusion and exclusion criteria, and 70 were included in the final analysis.

Outcomes of interest: demographics, pre-functional demands, energy of mechanism of injury, and radiographic characteristics.

Statistical analysis: JMP Software was used. Patient characteristics were summarized using means and standard deviations. Categorical variables were described using counts and proportions. Paired t-test or Wilcoxon test was used depending on the normality of the data. Kaplan-Meier survival curves were generated to compare the incidence of subsidence as identified by UV, RH, VT, and RI. Significance level was set *a priori* at  $\alpha = 0.05$ .

### **RESULTS:**

The overall incidence of post-treatment subsidence was 29/70 (41.42%) in nonoperatively treated DRFs. ChiSquare analysis showed that a history of attempted closed reduction during initial DRF treatment was associated with a higher incidence of subsidence within 2 weeks of treatment ( $p = 0.0003$ ) and overall ( $p = 0.0001$ ). Type C fractures were associated with a higher risk of subsidence than types A and B ( $P=0.02$ ). Of the 49 who did not subside within the first 2 weeks post-treatment, 7 patients (14.3%) developed subsidence between weeks 2 and 6 (*Table 1*). Out of the 42 patients that did not subside by week 6 post-treatment, only 2 (4.8%) subsided between weeks 6 and 12 (*Figure 1*). Kaplan-Meier curves and log-rank test showed significant differences between RH, UV, VT, and RI relative to the subsidence progression each of these parameters identified ( $p < 0.0001$ ) (*Figure 2*).

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## DISTAL RADIUS FRACTURE SUBSIDENCE AFTER NONOPERATIVE TREATMENT

Presenter: Kenan Alzouhayli, BA

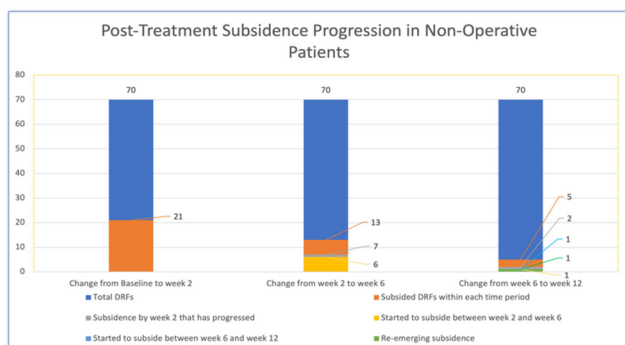


Figure 1: Subsidence progression over 12 weeks, divided over 3 follow-up periods.

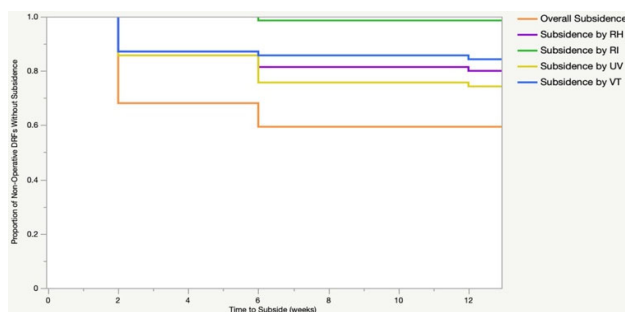


Figure 2: Kaplan-Meier curve showing development of overall subsidence in patients AND subsidence development as identified by each parameter.

### DISCUSSION:

Previous studies identified closed reduction's association with malunion.<sup>3</sup> We further found in this study that closed reduction is a risk factor for subsidence, especially within the first two weeks of nonoperative DRF treatment.

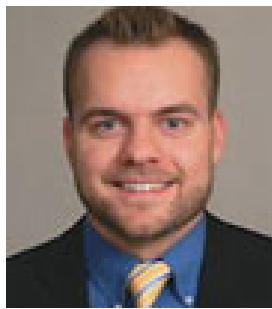
Additionally, nearly 95% of DRF subsidence was found to occur within the first 6 weeks after non-operative treatment. Our findings offer insight into when to expect subsidence and how it progresses.

### REFERENCES:

1. Court-Brown, et al. *Injury*. Vol37: 691-697, 2006
2. Ng, et al. *JBJS*. Vol93: 145-150, 2011
3. Brogen, et al. *AOTS*. Vol135: 927 - 933, 2015

**ACKNOWLEDGEMENTS:** The parent project is partially funded by Acumed.

**DISCLOSURES:** none.



*Nicholas Walla, MD is a Resident in Orthopaedics at The Ohio State University*

## RELIABILITY OF VISUAL ASSESSMENT AND IDENTIFICATION OF RISK FACORS FOR A LARGE J-SIGN IN PATELLAR INSTABILITY

Authors: Nicholas Walla, Toren Moore, Sarah Harangody, Sean Fitzpatrick, David Flanigan, Robert Duerr, Robert Siston, Robert Magnussen  
 Presenter: Nicholas Walla, MD

**Intro:** Patellar instability is a debilitating clinical problem that results in decreased knee function. A J-sign is a clinical finding that can be used to assess the severity of patellar maltracking. The purpose of this study is to assess inter- and intra-rater reliability of classification of the J-sign as “large” versus “small or none” as compared to another two-level system (“present” versus “absent”) and a three-level system (“large,” “small,” or “none”) and to identify anatomical and patient factors associated with presence of a large J-sign.

**Methods:** Forty patients (40 knees) with recurrent patellar instability were prospectively enrolled and recorded on video actively extending their knee while seating. Four raters classified patellar tracking on two separate occasions using three systems: 1) Two groups: J-sign versus no J-sign, 2) Three groups: large J-sign, small J-sign, or no J-sign, and 3) Two groups: large J-sign versus small or no J-sign. Intra- and inter-rater reliability of each system was assessed using Kappa statistics. Anatomical (trochlear dysplasia, TT-TG distance, patellar height) and patient (Beighton score) factors as well as KOOS subscales were compared between patients with a large J-sign and patients with a small or no J-sign using unpaired t-tests and Fisher’s exact tests.

**Results:** Inter- and intra-rater reliability was found to be highest with the two-level classification system of a large J-sign versus a small or no j-sign (Inter-rater Kappa = 0.76, Intra-rater Kappa = 0.75). Patients with a large J-sign had more severe trochlear dysplasia as assessed with the sulcus angle ( $p = 0.042$ ) and were more likely to have a tight lateral retinaculum ( $p = 0.032$ ) and elevated Beighton score ( $p = 0.009$ ). No significant differences in KOOS subscales were noted based on presence of large J-sign versus small J-sign or no J-sign.

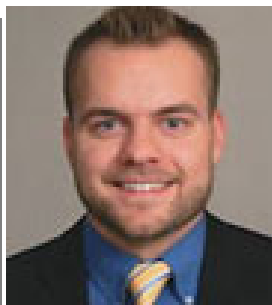
**Table 3: Imaging and Physical Examination Findings Based on Patellar Tracking**

	Normal Tracking or Small J-sign (n = 32)	Large J-sign (n = 8)	Significance
Caton-Deschamps Index (CDI)	1.15 ± 0.16	1.24 ± 0.17	p = 0.17
CDI > 1.3	8 (25%)	2 (25%)	p = 1.0
Crossing Sign	No = 4 (12%) Yes = 28 (88%)	No = 0 (0%) Yes = 8 (100%)	p = 0.57
ST Spur	No = 29 (91%) Yes = 3 (9%)	No = 6 (75%) Yes = 2 (25%)	p = 0.26
Boss Height	2.8 ± 1.8	3.0 ± 1.9	p = 0.78
TT-TG	13.0 ± 3.7	15.4 ± 3.4	p = 0.10
TT-TG > 16	3 (9%)	3 (38%)	p = 0.082
Sulcus angle	158 ± 12	168 ± 12	p = 0.042
Trochlear Depth	2.3 ± 1.5	1.2 ± 1.9	p = 0.086
Tilt	19.1 ± 6.7	21.8 ± 12.0	p = 0.40
PTI	36 ± 14%	33 ± 23%	p = 0.64
Tight LR	No = 28 (88%) Yes = 4 (12%)	No = 4 (50%) Yes = 4 (50%)	p = 0.032
Beighton Score	5 or less: 30 (94%) 6 or more: 2 (6%)	5 or less: 4 (50%) 6 or more: 4 (50%)	p = 0.0095

CDI, caton-deschamps index; LR, lateral retinaculum; TT-TG, tibial tubercle-trochlear groove distance

**Table 2: Intra-rater reliability**

	Kappa				
	Rater 1	Rater 2	Rater 3	Rater 4	Mean
J-sign: 2 categories: Present versus absent	0.66	0.75	0.75	0.74	<b>0.72</b>
J-sign: 3 categories: Big, small, none	0.69	0.59	0.65	0.68	<b>0.65</b>
J-sign: 2 categories: Big versus small or none	0.66	0.73	0.84	0.78	<b>0.75</b>



## RELIABILITY OF VISUAL ASSESSMENT AND IDENTIFICATION OF RISK FACORS FOR A LARGE J-SIGN IN PATELLAR INSTABILITY

Presenter: Nicholas Walla, MD

**Conclusion:** Quantitative visual assessment of patellar tracking with the J-sign demonstrates substantial inter- and intra-rater reliability, particularly utilizing a two-group classification system to identify knees with a large J-sign. Patients with a large J-sign demonstrate an increased incidence of a tight lateral retinaculum, generalized ligamentous laxity, and trochlear dysplasia.

### References

1. Fithian et al. *Am J Sport Med.* 2004
2. Dejour et al. *Knee Surg Sports Traumatol Arthrosc.* 1994
3. Post et al. *Orthop J Sports Med.* 2018
4. Smith et al. *Knee.* 2012
5. Frosch et al. *Arch Orthop Trauma Surg.* 2016
6. Schneider et al. *Am J Sports Med.* 2016;44:2993-3005.
7. Erickson et al. *Am J Sport Med.* 2019;47:1331-1337.
8. Hiemstra et al. *Am J Sports Med.* 2019;47:2904-2909.
9. Sappey-Marinié et al. *Am J Sports Med.* 2019;47:1323-1330.
10. Zhang et al. *Knee Surg Sports Traumatol Arthrosc.* 2021;29:1183-1190.
11. Zhang et al. *Knee Surg Sports Traumatol Arthrosc.* 2020;28:2147-2156.
12. Donell et al. *Knee Surg Sports Traumatol Arthrosc.* 2017;25:2682-2687.
13. Best et al. *Am J Sports Med.* 2020;48:370-375.
14. Beckert et al. *Iowa Orthop J.* 2016;36:94-97.
15. Xue et al. *Knee Surg Sports Traumatol Arthrosc.* 2018;26:3620-3625.
16. Tanaka et al. *Knee Surg Sports Traumatol Arthrosc.* 2016;24:3634-3641.
17. Charles et al. *Am J Sports Med.* 2013;41:374-384.
18. Biyani et al. *Knee Surg Sports Traumatol Arthrosc.* 2014;22:2334-2341.
19. Elias et al. *Knee.* 2016;23:450-455.
20. Elias et al. *Knee.* 2018;25:262-270.
21. Rezvanifar et al. *Knee.* 2019;26:1234-1242.

**Disclosures-** None



*Daniel Li, MD  
is a resident in  
Orthopaedics at  
The Ohio State  
University*

## EFFECT OF TRANEXAMIC ACID ON POST-OPERATIVE PAIN AND FUNCTION AFTER TOTAL JOINT ARTHRPLASTY

Authors: Daniel Li, MD; Kenan Alzouhayli, BA; Jesse Morris, MD; Nicholas Greco, MD  
Presenter: Daniel Li, MD

Intra-articular tranexamic acid (TXA) use in primary total joint surgery (TJA) has been shown to reduce the rate of postoperative pain.<sup>1</sup> Early mobilization within the first 24 hours after a TJA reduces the length of hospital stay.<sup>2</sup> There remains a functional gap regarding differences in post-operative pain and functional recovery by the postoperative day (POD) 1.

The objective of this study was to examine POD1 differences in pain and functional recovery relative to intra-operative TXA use.

We hypothesized that TXA use would not have an effect on pain and functional status by POD1.

### **METHODS:**

This is a retrospective cohort study of 325 patients who underwent a primary TJA performed by a single surgeon between September 2019 and September 2020. Patients were grouped based on intra-operative TXA administration (TXA vs. No TXA). Variables of interest were demographics, visual analogue scale (VAS) pain scores, activity measure for post-acute care (AMPAC) scores, and morphine milliequivalents consumed. Patients with a preoperative history of opioid use were excluded. Electronic medical records were reviewed with institutional review board approval (IRB: 2020H0454).

Patient characteristics were summarized using means and standard deviations. Logistic regression models were used to adjust for age, anesthesia, comorbidity index, procedure, and gender. ChiSquare test and Fischer's exact test were used for categorical variables and two-sample t-test and Kruskal-Wallis were used for continuous variables.

### **RESULTS:**

265 patients were included in the final analysis, with 218 patients in the TXA group and 47 in the No TXA group. The two groups did not have significant differences relative to BMI, gender, baseline diagnosis, and procedure performed ( $P>0.2$ ). Patients who received TXA tended to be younger ( $P=0.001$ ), undergo spinal anesthesia ( $P=0.0002$ ), and have higher comorbidity index scores ( $P<0.0001$ ).

Patients who received TXA tended to be younger ( $P=0.001$ ), undergo spinal anesthesia ( $P=0.0002$ ), and have higher comorbidity index scores. ( $P<0.0001$ ). There was a statistically significant difference in the change of AMPAC scores from POD0 compared to pre-operatively; patients with TXA had a median score of -6 while those without TXA had a median score of -7 ( $P=0.03$ ). However, this effect disappears when comparing the difference in AMPAC scores on POD1 compared to POD0 ( $P=0.12$ ).

*Continued on Next Page*



## EFFECT OF TRANEXAMIC ACID ON POST-OPERATIVE PAIN AND FUNCTION AFTER TOTAL JOINT ARTHRPLASTY

Presenter: Daniel Li, MD

Outcome	Unadjusted model			Adjusted model I			Adjusted model II			
	Comparison Tranexamic Acid (yes/no)	OR	95% CI	p-value	OR	95% CI	p-value	OR	95% CI	p-value
<b>Categorical</b>										
Pain POD 0 rest		1.12	0.62, 2.03	0.717	1.59	0.82, 3.07	0.171	1.55	0.79, 3.03	0.200
Pain POD 0 activity		1.09	0.58, 2.03	0.798	1.44	0.72, 2.88	0.308	1.37	0.68, 2.78	0.382
Pain POD 1 rest		0.92	0.49, 1.71	0.787	1.07	0.55, 2.09	0.841	1.14	0.58, 2.23	0.707
Pain POD 1 activity		0.58	0.30, 1.12	0.104	0.65	0.32, 1.32	0.235	0.66	0.32, 1.35	0.256
<b>Continuous</b>										
Pain POD 0 rest	<b>Beta</b>	<b>95% CI</b>	<b>p-value</b>	<b>Beta</b>	<b>95% CI</b>	<b>p-value</b>	<b>Beta</b>	<b>95% CI</b>	<b>p-value</b>	
Pain POD 0 rest	0.28	-0.64, 1.19	0.552	0.94	0.002, 1.88	<b>0.050</b>	0.97	0.03, 1.90	<b>0.043</b>	
Pain POD 0 activity	-0.08	-1.15, 0.99	0.879	0.45	-0.68, 1.57	0.434	0.42	-0.69, 1.53	0.460	
Pain POD 1 rest	-0.44	-1.37, 0.50	0.358	-0.14	-1.11, 0.83	0.778	-0.01	-0.98, 0.96	0.979	
Pain POD 1 activity	-0.45	-1.41, 0.52	0.362	-0.22	-1.25, 0.80	0.667	-0.23	-1.27, 0.81	0.666	
TOTAL MORPHINE	-4.86	-17.95, 8.23	0.465	4.92	-7.49, 17.32	0.436	4.32	-8.09, 16.74	0.493	
Log of MORPHINE	-0.22	-0.86, 0.41	0.489	-0.03	-0.69, 0.62	0.922	-0.08	-0.73, 0.58	0.817	

Table 1: The association between TXA use (Yes/No) and pain outcomes.

Measure	Time	Tranexamic acid: Yes			Tranexamic acid: No		
		Estimate	95% CI	p-value	Estimate	95% CI	p-value
<b>Unadjusted model</b>							
AMPAC	Baseline Pre	23.90	23.65, 24.16		23.80	23.24, 24.35	
	POD0 - baseline	-6.87	-7.16, -6.59	<.0001	-8.02	-8.64, -7.40	<.0001
	POD1 - POD0	1.15	0.83, 1.46	<.0001	1.03	0.41, 1.65	0.0012
	p-value for interaction	0.0005					
<b>Adjusted model I</b>							
AMPAC	Baseline Pre	23.56	23.18, 23.95		23.79	23.23, 24.36	
	POD0 - baseline	-6.87	-7.16, -6.59	<.0001	-8.01	-8.63, -7.39	<.0001
	POD1 - POD0	1.18	0.87, 1.50	<.0001	1.04	0.42, 1.66	0.0011
	p-value for interaction	0.0004					
<b>Adjusted model II</b>							
AMPAC	Baseline Pre	23.93	23.35, 24.13		23.93	23.36, 24.50	
	POD0 - baseline	-6.87	-7.16, -6.59	<.0001	-8.01	-8.63, -7.39	<.0001
	POD1 - POD0	1.19	0.87, 1.50	<.0001	1.03	0.41, 1.66	0.0012
	p-value for interaction	0.0004					

Table 2: The association between TXA use (Yes/No) and AMPAC scores.

### DISCUSSION:

Although there was a statistical difference in AMPAC score changes between the two groups on POD0 compared to pre-operatively, this difference was not clinically significant.<sup>3</sup> This study suggests that intra-operative TXA use has no effects on immediate pain and functional recovery after a TJA.

We recommend future studies to isolate differences between intravenous and oral TXA effects. In addition, studies should determine whether the difference in clinical outcome measures correlates with clinically significant differences.

### REFERENCES:

1. Petersen, et al. *AOTS*. 142: 2287 - 2293, 2022
2. Guerra, et al. *Clinical Rehab*. 28: 844 - 854, 2015
3. Lee, et al. *Physical Therapy*. 97:1094 - 1102, 2017

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DISCLOSURES: none.



*Thomas J. Utset-Ward is a Fellow in Musculoskeletal Oncology at The Ohio State University*

## **METASTATIC BONE DISEASE: IS TREATMENT AT AN ACADEMIC CANCER CENTER OR HIGH-VOLUME CENTER ASSOCIATED WITH IMPROVED SURVIVAL?**

Authors: Thomas Utset-Ward, MD, Azeem Malik, MD, Frank Chiarappa, Rex Haydon, John Alexander, MD

Presenter: Thomas J. Utset-Ward, MD

### **INTRODUCTION:**

Advances in oncologic treatment, targeted chemotherapy and immunosurvival are improving the survival of patients with metastatic cancer. With longer survival, there is an increased prevalence of metastatic bone disease. Patients with metastatic bone disease frequently require orthopedic interventions either prophylactically or to treat pathologic fractures.

Treating metastatic cancer can necessitate resource-intensive care and requires the expertise of an integrated multi-disciplinary team for the best outcomes. This study aims to answer 1. Is overall survival of patients with metastatic bone disease improved with treatment at academic cancer centers and high-volume centers? 2. Are the patient characteristics in metastatic bone disease different between those treated in academic versus community cancer centers and high versus low-volume centers? We hypothesize overall survival will improve with care at high-volume and academic cancers.

### **METHODS:**

All National Cancer Center Database (NCDB) records from 2004-2021 were evaluated which included 64 histologic subtypes and n=350,943 with bone metastases, including patients with multiple myeloma. Academic center was defined using the Commission on Cancer facility designation as reported in the NCDB as an Academic/Research Program. We identified high-volume facilities as those treating at least 20 patients per year. Overall survival from time of diagnosis represented the primary endpoint and was estimated by Kaplan Meier method with log-rank test for significance. For tumor subtype analyses, only those with >1,000 metastatic bone disease patients were considered.

Continuous variables were compared via Wilcoxon test, categorical variables with Chi-squared, and multivariable Cox models adjusted for confounders. Multivariate Cox regression analyses were used to assess whether undergoing treatment at a high-volume facility or academic cancer center was associated with a lower risk of overall mortality, after controlling for differences in baseline demographics, tumor presentation, and treatment characteristics. Significance was set at  $p < 0.05$  and the false-discovery-rate correction adjusted for multiple comparisons.

### **RESULTS:**

Patients treated at academic centers survived significantly longer than those treated elsewhere (median 16.3 vs. 9.3 months,  $p < 0.0001$ ). When considering individual histologic subtypes, 16 out of 19 tumor types had significantly better survival when treated at academic centers. Myeloma patients had better survival than other tumor types (median 49.2 vs. 7.3 months). When myeloma and MBD was analyzed separately, significantly better survival was observed in both groups at academic centers (63.5 vs. 39.2 months for myeloma, 8.8 vs. 6.5 months for other tumors,  $p < 0.0001$  for both).

Patients at academic centers were significantly younger and healthier. After correcting for patient characteristics, treatment at an academic center remained independently associated with significantly improved survival (multivariable HR 0.84, 95% confidence interval 0.83-0.85).

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## METASTATIC BONE DISEASE: IS TREATMENT AT AN ACADEMIC CANCER CENTER OR HIGH-VOLUME CENTER ASSOCIATED WITH IMPROVED SURVIVAL?

Presenter: Thomas J. Utset-Ward, MD

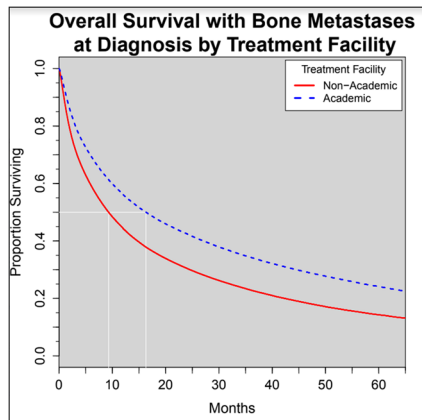


Figure 1: Overall survival in patients with bone metastases and myeloma based on treatment at an academic center (blue dashed line, n=120,880) or community center (red solid line, n=214,181). Median survival (white line) was significantly longer among patients treated at academic centers (16.3 vs. 9.3 months,  $p < 0.0001$ )

### DISCUSSION:

In patients with metastatic bone disease at diagnosis, treatment at an academic center was associated with significantly better survival. The most pronounced difference was seen in myeloma, thyroid, prostate, breast and kidney; all of which have a proclivity for bone metastasis and are commonly treated by orthopaedic surgeons. The etiology of this survival advantage remains unclear but is likely multifactorial.

Although the improved survival seen in academic centers cannot be attributed to orthopaedic care, many of these patients will require orthopaedic intervention. Referral to academic centers has become the standard in sarcoma care and should be considered for certain patients with metastatic bone disease and myeloma.

### REFERENCES:

1. Author, et al. *Journal*. Vol#:1<sup>st</sup> page - last page, year

DISCLOSURES: None



*Christian Curatolo, MD is a Resident in Orthopaedics at The Ohio State University*

## IMMEDIATE WEIGHT BEARING AFTER MODIFIED-BROSTRÖM RECONSTRUCTION: A RETROSPECTIVE REVIEW OF AN ACCELERATED REHAB PROTOCOL

Authors: Christian Curatolo, MD, Andrew Rust, BS, Harish Chinnasamy, BS, Kevin Martin, DO, FAAOS

Presenter: Christian Curatolo, MD

Majority of injuries to the anterior talofibular ligament (ATFL) will go on to heal with non-operative management. Nearly a third of these injuries, however, will go on to develop chronic pain and instability; in these cases, operative reconstruction is indicated. An anatomic modified Broström reconstruction has replaced a traditional tenodesis as the standard of care. This reconstruction is often limited by damage to the native tissue and the time required for ligamentous healing, restricting the benefits of early weight bearing. In order to maximize the benefits of early range-of-motion exercises and weight bearing while protecting the repair, a suture-tape augmented Broström procedure has been suggested. We hypothesized that a suture-tape augmented Broström procedure would allow early weightbearing while preventing early failure.

### **METHODS:**

A retrospective chart review of patients who underwent a suture-tape augmented Broström procedure from August, 2020 to January, 2023 was conducted. Our inclusion criteria consisted of MRI confirmation of ATFL injury, a positive anterior drawer, failure of non-operative management, and post-operative physical exam consisting of a single leg hop test and single leg heel raise at six and twelve weeks. Patients who had concomitant cartilage injuries with allograft repair, posterior arthroscopic debridement, peroneal tendon repair, syndesmosis repair, or calcaneal osteotomies were excluded from our study. All patients participated in our accelerated rehab protocol which included immediate post-operative weightbearing as tolerated (WBAT) in a fracture boot for two weeks followed by WBAT in a lace-up ankle brace for at least four weeks. Physical therapy was initiated two weeks post-op. Our primary outcome was the ability of patients to perform a single leg hop test and single leg heel rise at six and twelve weeks. Secondary outcomes included visual analog scores (VAS) and post-operative complications (DVTs, failure, infection, return to OR, etc.)

### **DATA AND RESULTS:**

128 patients were identified that met our inclusion criteria. Our patients included 37 males and 91 females with a mean age of  $36 \pm 12$  (range, 18-68) years; our mean follow up was 11 (range, 6-52) weeks. At 6 weeks postoperatively, 88 (90%) of the patients asked could perform a single-leg heel raise and 73 (80%) of the patients asked could perform a single-leg hop. The average VAS at the final follow up visit was  $1.03 \pm 1.9$  (range, 0-8). Of the 128 patients operated on, 0 patients required a revision surgery. Post-operative complications were peroneal or sural neuritis (6 patients) and persistent pain (4 patients). There was no statistical difference in primary and secondary outcomes in patients who had concomitant cartilage injuries not treated with grafting. Male patients were more likely to be able to complete a single leg hop at 6 weeks postoperatively than female patients ( $p = .04$ ). No significant difference was found amongst other demographic factors.

### **DISCUSSION:**

This study demonstrated that a modified-Broström procedure with suture-tape augmentation allowed for immediate weight bearing without reconstruction failure. The vast majority of patients had an excellent functional outcome at six weeks post-operative with minimal complications being recorded. There were no cases of revision surgery, DVTs, post-operative infections, and no patients reported residual instability.

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## **WEIGHT BEARING AFTER MODIFIED-BROSTROM RECONSTRUCTION: A RETROSPECTIVE REVIEW OF AN ACCELERATED REHAB PROTOCOL**

Presenter: Christian Curatolo, MD

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### **REFERENCES:**

1. *Piscoya, et al. J Foot Ankle Surg. Vol#:* 61(2):390-395, 2022
2. *Acevedo, et al. Foot Ankle Int. Vol#:* 36(4):465-73, 2015

### **ACKNOWLEDGEMENTS:**

We have no acknowledgements.

### **DISCLOSURES:**

We have no financial disclosures.



*Thomas J. Utset-Ward is a Fellow in Musculoskeletal Oncology at The Ohio State University*

## **OPTICAL COHERENCE TOMOGRAPHY FOR SURGICAL MARGIN ASSESSMENT IN SOFT TISSUE SARCOMA**

Authors: LE Selmic, Thomas J. Utset-Ward, MD, Thomas Scharschmidt, MD, John Alexander, MD, Joel Mayerson, MD

Presenter: Thomas J. Utset-Ward, MD

### **INTRODUCTION:**

Negative surgical margins are critical for optimal local control in soft tissue sarcomas (STS) and can even influence overall survival. The gold standard for assessment of surgical margins is post-operative histopathology, however this approach assesses only limited areas of large and complex specimens and does not provide real-time results to guide intra-operative decision-making. There has been increasing interest in intraoperative margin assessment tools, but many are dependent on preferential uptake of fluorescent dyes, which is not universal, and limited to a macroscopic scale. Optical coherence tomography (OCT) is a near-infrared imaging technology that uses light-waves to generate real-time high-resolution microscopic images of tissue microstructure. This approach has previously been shown to have high sensitivity (92-100%) for intra-operative detection of histopathologically positive margins in human breast cancer. Recently, our group has demonstrated good sensitivity (83-88%) and specificity (92-93%) of OCT for detection of microscopically positive margins in canine STS.

The purpose of this study is to demonstrate whether OCT can assess surgical margins in areas of interest, comparably to traditional post-operative histopathology. We hypothesize that (1) OCT imaging would correlate well with histopathology and that OCT would be sensitive for detection of incomplete margins and (2) surgeons can reliably be trained to interpret OCT images with high diagnostic accuracy and inter-rater reliability.

### **METHODS:**

OCT imaging was performed immediately after resection of 20 extremity and superficial trunk STS following informed patient consent as part of an IRB approved study. In each case, a single 1cm<sup>2</sup> area was identified intra-operatively by the surgeon as the closest surgical margin. This area was imaged with a spectral domain OCT system (Telesto, Thorlabs Inc.) and subsequently processed for standard histopathological assessment. The pathologist was blinded to the OCT imaging results. We then trained 6 blinded surgeons how to read OCT images in a 1-hour training session and tested diagnostic accuracy, the positive and negative predictive value of OSCT images for margin status as well as the intra- and inter-rater reliability.

### **RESULTS:**

A total of 20 patients were included in the study. The initial phase consisted of 5 patients and the second expanded phase included 15. Multiple histologic subtypes were included in the 20 resected specimens. In the initial phase of 5 patients, one patient received preoperative radiation therapy, one received neoadjuvant chemotherapy, and one patient received both preoperative radiation therapy and neoadjuvant chemotherapy. Of the areas selected for assessment, on histopathology two contained normal fascia, two contained skeletal muscle and one had a thin layer of fat and fascia overlying the sarcoma. All margins were classed as R0 by a distance of 0.3-2mm. On OCT imaging, differences in optical scattering intensity and tissue organization were readily detectable by tissue type. Differences in tissue microstructure between adipose and fascial tissue could be determined as well as, in one cases, a close but negative margin on the microstructural level. In contrast to normal tissues, sarcoma demonstrated high scattering, no microstructural organization, and rapid light attenuation limiting imaging depth.

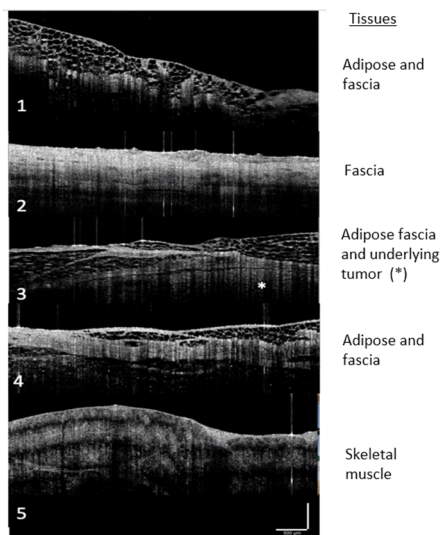
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## OPTICAL COHERENCE TOMOGRAPHY FOR SURGICAL MARGIN ASSESSMENT IN SOFT TISSUE SARCOMA

Presenter: Thomas J. Utset-Ward, MD

**Figure 1:** OCT images from 5 patients. In case/pane 3, the sarcoma tissue could be visualized on OCT images (indicated by \*) underlying a thin fascia layer, which represented a close but negative surgical margin.



### DISCUSSION:

OCT has the potential to differentiate between tumoral and normal tissues on the micro-structural level in soft tissue sarcoma resection margins. The margins as assessed by OCT are comparable to those seen on final histopathologic analysis. In this pilot study, surgeons were reliably trained to read OCT images and accurately differentiate between normal and tumoral tissues on the micro-structural level. Ongoing work will assess the formal diagnostic performance of OCT for the detection of microscopically positive surgical margins.

**ACKNOWLEDGEMENTS:** None

**DISCLOSURES:** None



*Kenan Alzouhayli, BA is a 4th Year Medical Student at the Ohio State University College of Medicine*

## OPERATIVE EFFICIENCY AND COMPLICATIONS FOLLOWING RELEASE OF THE SHORT EXTERNAL ROTATORS DURING THE DIRECT ANTERIOR APPROACH TO TOTAL HIP ARTHROPLASTY

AUTHORS: Kenan Alzouhayli, BA; Jesse Morris, MD; Daniel Li, MD; Nicholas Greco, MD  
 PRESENTER: Kenan Alzouhayli, BA

### **INTRODUCTION:**

The direct anterior approach (DAA) to total hip arthroplasty (THA) is performed with a smaller incision, causes less muscle damage, and provides more accurate implant placement than other approaches.<sup>1,2</sup>

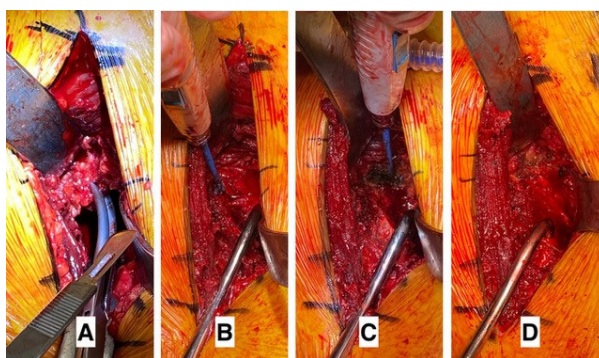
The objective of this retrospective study was to examine whether the release of the short external rotators during DAA THA would improve operative efficiency.

We hypothesized that the DAA would decrease operative time without increasing complication rates when compared to a group in which preservation of these muscles was attempted.

### **METHODS:**

This was a matched retrospective cohort study. All DAA THA performed by the senior author at a single institution were eligible. The conjoint tendon was purposefully released, and the piriformis tendon “flipped” in the experimental group (*Figure 1*) versus attempted preservation in the control group.<sup>3</sup> Exclusion criteria were age <18 years, fractures, dysplasia, or revision surgery. A minimum 6-week follow-up was required.

The primary outcome of interest was operative time. Secondary outcomes included radiographic parameters and complication rates. Multivariate logistic regression assessed for independent factors affecting surgical time. Linear regression examined the “learning curve”.



**Figure 1: Progressive steps in femoral exposure. Posterior and superior capsule resection (A). Retractors are replaced to “reset” the femur with a bone hook seen in the trochanter (B). Release of the anterior-based conjoint tendon (C). “Flipping” of the piriformis tendon over the greater trochanter (D).**

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## OPERATIVE EFFICIENCY AND COMPLICATIONS FOLLOWING RELEASE OF THE SHORT EXTERNAL ROTATORS DURING THE DIRECT ANTERIOR APPROACH TO TOTAL HIP ARTHROPLASTY

Presenter: Kenan Alzouhayli, BA

### RESULTS:

There were 46 patients per group. There were no differences in radiographic measures or complication rates. The release group showed a statistically significant decrease in operative time (73 vs 90.5 minutes,  $p < 0.001$ ) (Table 1). On multivariate analysis, short external rotator release and BMI were independently related to operative time. The “learning curve” of DAA was clinically negligible (-0.035 minutes per case for the first 46 cases,  $p = 0.03$ ).

**Table 1:**

	Standard of Care (N = 46)	External Rotator Release (N = 46)	p-Value
Operation Time (min)	90.5 ± 19.7	73.0 ± 15.4	<.001
Acetabular Inclination (deg)	42.5 ± 5.5	39.2 ± 5.2	.002
Acetabular Version (deg)	21.8 ± 7.5	29.7 ± 8.9	<.001
Femoral Stem Coronal Alignment (deg)	-1.3 ± 19.7	-9 ± 1.9	.160
Femoral Stem Version (deg)	14.8 ± 6.5	17.3 ± 7.4	.040
Subsidence (mm)	.6 ± 1.1	.8 ± .8	.300
Last Radiographic Follow-Up (mo)	12.1 ± 8.2	8.3 ± 8.2	.004
Last Clinical Follow-Up (mo)	14.1 ± 8.4	9.3 ± 3.8	<.001

\*\*\*min=minutes, deg=degrees, Femoral Stem Coronal Alignment reported with “+” values representing varus alignment and “-” values representing valgus, mo=months

**Table 1: Surgical and Postoperative Outcomes.**

### DISCUSSION:

These data support the hypothesis that purposeful release of the short external rotators during DAA THA can improve operative efficiency with no change in radiographic measures or complication rates.

This study presents a novel addition to the current body literature and is the first analysis regarding the impact that short external rotator release has on operative efficiency. While previous studies on this topic have design characteristics that limit their generalizability including cadaver models, biomechanical studies, or short-term follow-up, our study attempts to overcome those limitations.

Limitations of this study include its retrospective design and the nature of operative time as a non-specific measure that is influenced by anesthesia, radiology, and body habitus.

### REFERENCES:

1. Yang, et al. *J Orthop Traumatol.* 22: 46 - 46, 2021
2. Crawford, et al. *Surg Technol Int.* 35:377-385, 2019
3. Gudena, et al. *Hip International.* 25: 424-427, 2011

**ACKNOWLEDGEMENTS:** No funding resources.

**DISCLOSURES:** none.



*Hannah Harris, MD is a resident in Orthopaedics at The Ohio State University*

## TREATMENT OF ISOLATED DISTAL ULNAR FRACTURES: A 10-YEAR RETROSPECTIVE REVIEW

Authors: Nisha Crouser, MD, Hannah Harris, MD, Micayla Zeltman, PA-C, James Gallagher, MD, Parth Vaghani, BS, Amy Speeckaert, MD

Presenter: Hannah Harris, MD

### INTRODUCTION:

Isolated fractures of the distal ulna are relatively uncommon and are typically associated with a direct blow to the ulna. Complications associated with these fractures include malunion, nonunion, radioulnar synostosis and loss of motion. There is limited literature available regarding management of distal ulna fractures, typically decisions are made based on surgeon preference and fracture/patient characteristics. The distal ulna is notorious for its prolonged healing time. Indications for surgical intervention are highly debated, displacement of greater than 50% is considered one indication for surgical fixation.

The purpose of this study was to evaluate the practice patterns for distal ulna fractures over a 10-year period at a single institution including type of immobilization, length of immobilization and surgical technique. This study aims to compare time to union and non-union rates between operative and non-operative treatment.

### METHODS:

A retrospective chart review of patients seen from 1/1/2010 -1/1/2020 treated for isolated distal ulna fractures at The Ohio State University Wexner Medical Center was performed. A total of 9 fellowship-trained hand surgeons were included during this time period. Inclusion criteria: isolated distal ulnar fractures, radiographic follow-up of at least 6-weeks and subjects 18 years of age and older. Exclusion criteria: ulnar styloid fractures, less than 6 weeks of radiographic follow up, minors and prisoners.

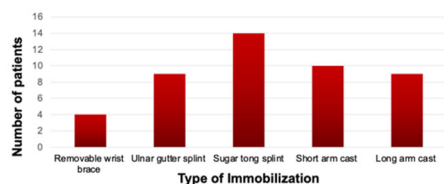
Statistical analysis was performed using Fisher’s Exact Test and Wilcoxon Rank Sum Test.

### RESULTS:

A total of 91 patients were identified as having an isolated distal ulna fracture, 59 patients met inclusion criteria. 46 patients were treated non-operatively with immobilization alone and 13 patients were treated with surgical intervention.

#### *Non-operative treatment*

A wide range of initial immobilization methods were used (Figure 2).



**Figure 2.** Initial non-operative treatment used by surgeons for management of isolated distal ulna fractures.

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## TREATMENT OF ISOLATED DISTAL ULNAR FRACTURES: A 10-YEAR RETROSPECTIVE REVIEW

Presenter: Hannah Harris, MD

### Surgical treatment

92% of patients were treated with open reduction and internal fixation with a plate construct.

### Surgical versus Non-operative treatment

Fracture Characteristics: 61.5% of fractures in the operative group were comminuted compared with 30% in the non-operative group. 92% of fractures in the operative group were displaced versus 66% of patients in the non-operative group. Length of immobilization: Average length of immobilization in the non-operative cohort was 8.2 weeks. This was compared to 7.8 weeks in the operative group. Union rates: Average time to union was approximately 3 months in both groups. There were no significant differences in time to union or non-union rates (Table 1).

Characteristic	Treatment	Mean (SD) or %	P Value*
Length of Immobilization (weeks)	Surgical	7.8 (7.7)	0.255
	Non-Op	8.2 (4.8)	-
Time to Healing (weeks)	Surgical	14.7 (10.0)	0.654
	Non-Op	12.1 (5.9)	-
Non-Union Rate	Surgical	23.1% (3 of 13)	0.357
	Non-Op	10.9% (5 of 46)	-

\* Wilcoxon Rank Sum Test or Fisher's Exact Test (two-sided)

**Table 1.** Surgical versus non-operative management: length of immobilization and healing rates.

### DISCUSSION:

This study provides insight into the current trends in treatment of distal ulna fractures amongst fellowship-trained upper extremity surgeons at a single Level 1 Trauma center including preferences for non-operative and surgical management. Those fractures that were treated surgically had higher rates of comminution and displacement. Overall, there were no differences in non-union rates between fractures treated operatively or non-operatively. The average time to healing was approximately 3 months regardless of treatment modality. Given that isolated distal ulna fractures are rare, a large multi-center study is likely needed to fully evaluate practice patterns and determine a treatment algorithm.

### REFERENCES:

1. Pollock, et al. *JBJS* 65:339-342, 1983
2. Richards, et al. *J Hand Surg* 39:385-391, 2014
3. Dymond, et al. *JBJS* 66:408-410 1984
4. Ring, et al. *J Hand Surg Am* 29:2004
5. Sauder, et al. *Hand Clin* 23:179-184 2007
6. Hussain, et al. *Jour of Clin Orthopaedics and Trauma* 86-912018

### DISCLOSURES:

The authors have no financial disclosures.



*Tyler Ames, MD is a Fellow in Adult Reconstructive Orthopaedics at The Ohio State University*

## OUTCOMES FOLLOWING TOTAL JOINT ARTHROPLASTY IN PATIENTS WITH A COLOSTOMY

Authors: Tyler Ames MD, Hanna Sorensen BS, Adam G. F. Smith BS, Eric Kiskaddon MD, Daniel Li MD, Mengnai Li MD, PhD  
 Presenter: Tyler Ames, MD

### INTRODUCTION:

Patients with a colostomy are faced with unique challenges when undergoing total joint arthroplasty (TJA). Limited evidence currently exists to help guide counseling and treatment decisions in this unique patient population. The purpose of this study was to characterize a cohort of patients that had undergone both a colostomy and total joint arthroplasty in order to better understand outcomes and complications in this patient population. We hypothesize that colostomy patients who undergo TJA will have increased postoperative complications compared to controls.

### METHODS:

After institutional review board approval (#2020H0135), a retrospective review of all patients who had undergone TJA at our institution from 2011 to 2020 with a concomitant colostomy were identified. Patients were divided into two groups; those that had a colostomy prior to their index TJA and those that had a colostomy performed after TJA. A control group of patients from the same time period was selected for comparison. TJA procedures included were total knee arthroplasty (TKA), total hip arthroplasty (THA), anatomic total shoulder arthroplasty (aTSA), and reverse total shoulder arthroplasty (rTSA). Data was collected on patient demographics, post-operative length of stay (LOS), and postoperative complications. The data was analyzed using Chi-Square for categorical variables and t-tests for parametric continuous variables. Statistical analysis was performed with a p-value of <0.05 being considered statistically significant.

Characteristic	Control	Pre-TJA Colostomy	Pre-TJA vs. Control p-value	Post-TJA Colostomy	Post-TJA vs. Control p-value
Total Patients	115	11	-	10	-
Mean Age (SD)	62.2 (10.2)	66.2 (13.6)	0.228	66.6 (12.8)	0.198
Sex	F: 53.9% (n=62) M: 46.1% (n=53)	F: 36.4% (n=4) M: 63.6% (n=7)	0.266	F: 60.0% (n=6) M: 40.0% (n=4)	0.711
Mean BMI (SD)	31.1 (7.5)	28.2 (4.8)	0.204	35.1 (9.9)	0.118
Mean ASA (SD)	2.6 (0.6)	2.7 (0.5)	0.422	2.6 (0.5)	0.927
Mean CCI (SD)	2.9 (1.9)	5.5 (2.8)	<0.001	3.6 (2.0)	0.264
TKA	38.3% (n=44)	45.4% (n=5)	-	70% (n=7)	-
THA	30.4% (n=35)	27.3% (n=3)	-	30% (n=3)	-
aTSA	9.6% (n=11)	18.2% (n=2)	-	0.0% (n=0)	-
rTSA	21.7% (n=25)	9.1% (n=1)	-	0.0% (n=0)	-

Table 1: Patient Demographics.

### RESULTS:

In total, 21 patients who had undergone both a colostomy and TJA were identified. 52.4% had undergone colostomy prior to TJA and 47.6% had undergone colostomy after TJA. Average postoperative length of stay was 6.1 days in the pre-TJA colostomy group, 2.9 days in the post-TJA colostomy group, and 2.3 days in the control group (p=0.002, 0.162 respectively). Patients in both colostomy groups had statistically significant higher rates of 90-day postoperative emergency department visits, postoperative gastrointestinal (GI) complications, and postoperative deep vein thrombosis (DVT) compared to the control group. Patients in the post-TJA colostomy group also had greater non-home discharges compared to controls (p=0.003). 9.5% of colostomy patients had a postoperative infection requiring surgery versus 3.5% in the control group (p=0.215).

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## OUTCOMES FOLLOWING TOTAL JOINT ARTHROPLASTY IN PATIENTS WITH A COLOSTOMY

Presenter: Tyler Ames, MD

Characteristic	Control	Pre-TJA Colostomy	Pre-TJA vs. Control p-value	Post-TJA Colostomy	Post-TJA vs. Control p-value
Mean LOS (SD)	2.3 (1.4)	6.1 (12.8)	<b>0.002</b>	2.9 (0.7)	0.162
Post-Op ED Visit †	12.2% (n=14)	36.4% (n=4)	<b>0.028</b>	60.0% (n=6)	<b>&lt;0.001</b>
GI Complication †	0.0% (n=0)	18.2% (n=2)	<b>&lt;0.001</b>	40.0% (n=4)	<b>&lt;0.001</b>
DVT †	0.0% (n=0)	9.1% (n=1)	<b>0.001</b>	10.0% (n=1)	<b>&lt;0.001</b>
Non-home Discharge	19.1% (n=22)	27.3% (n=3)	0.518	60.0% (n=6)	<b>0.003</b>
Wound Infection Requiring Surgery †	3.5% (n=4)	9.1% (n=1)	0.363	10.0% (n=1)	0.313

(† within the first ninety postoperative days)

**Table 2:** Patient Outcomes and Complication Rates.

### DISCUSSION:

Patients with a TJA and concomitant colostomy comprise an under-reported cohort in the orthopaedic literature. There is currently limited evidence to determine the risk profile and expected postoperative course for patients with a colostomy undergoing TJA. This study provides descriptive data of the largest known cohort of patients with a colostomy and concomitant TJA. Patients should be counseled on the higher rates of postoperative complications as well as the potential need for emergency department and GI care following TJA. This data can help guide preoperative counseling and treatment decisions in this patient population.

### REFERENCES:

1. *Marcelo Lizarraga Ferrand et al. The Journal of arthroplasty* vol. 34,2S (2019): S37-S41.
2. *Kunutsor, Setor K et al. PloS one* vol. 11,3 Mar 2016
2. *Mirelman, D et al. Diseases of the colon and rectum* vol. 21,3 (1978): 172-6.

### ACKNOWLEDGEMENTS:

The Ohio State University Department of Orthopaedics Adult Reconstruction Division

### DISCLOSURES:

There are disclosures to report.



*Mia Qin, MD is a Fellow in Hand & Upper Extremity at The Ohio State University*

## OUTCOMES FOLLOWING SURGICAL DENERVATION OF THE THUMB CARPOMETACARPAL JOINT FOR OSTEOARTHRITIS

Authors: R. Mychael Dopirak, BS, Mia M Qin, MD, Kanu Goyal, MD  
 Presenter: Mia Qin, MD

### INTRODUCTION:

Osteoarthritis of the thumb carpometacarpal (CMC) joint affects 8% of men and 25% of women over the age of 50.<sup>1</sup> Osteoarthritis of the thumb CMC joint is debilitating and significantly impacts quality of life. Denervation of the CMC joint is a relatively new procedure compared to traditional surgical approaches following failure of conservative treatment. The aim of this study is to determine patient perceived effectiveness of thumb carpometacarpal (CMC) denervation as treatment for CMC arthritis.

### METHODS:

After IRB approval, patients who underwent CMC denervation were interviewed via telephone call after at least three months of post-operative recovery and a chart review was performed. 20 patients (23 thumbs) were interviewed in this study and chart review alone was performed in an additional 7 patients. Patients were asked to rate CMC pain at rest and with activities of daily living (ADL), both pre-operatively and post-operatively. Patients were also asked to rate their perceived pain and functional improvement, overall satisfaction, and if they would undergo CMC denervation again. Eaton-Littler arthritis stage was determined from pre-operative radiographs. Mean patient demographic information, post-operative pain ratings at rest and with ADL were compared to pre-operative ratings using t-tests. Perceived improvements in pain were coupled to Eaton-Littler stage to assess the correlation between pre-operative arthritic stage and post-operative pain improvement.

### RESULTS:

Patient reported pain at rest (pre-op 6.1 vs post-op 3.0,  $p < 0.01$ ) and with ADL (pre-op 8.3 vs post-op 4.6,  $p < 0.01$ ) was found to have significantly reduced following CMC denervation (Figure 1). There is wide variability within each measurement. Patient reported pain and functional improvement was inconsistent, with some patients with no improvement, some with complete improvement, and many in the middle (Figure 2). There was no discernable correlation between pre-operative Eaton-Littler arthritic stage and patient reported pain improvement.

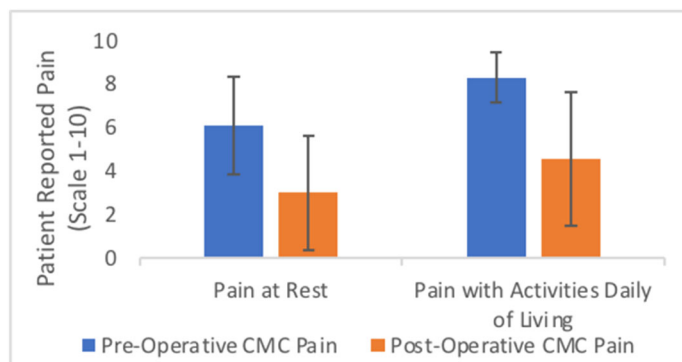


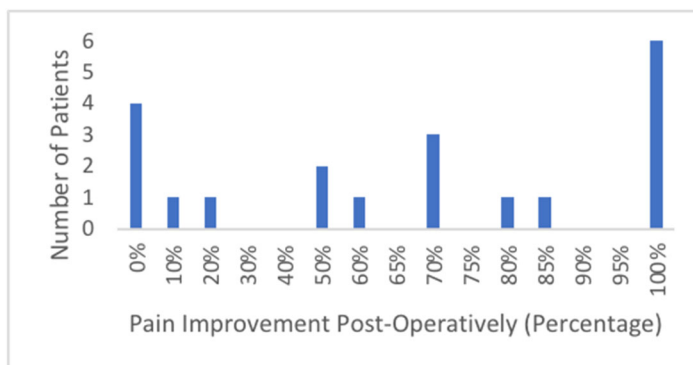
Figure 1. Comparison of CMC pain at rest and with ADL before and after denervation

Continued on Next Page



## OUTCOMES FOLLOWING SURGICAL DENERVATION OF THE THUMB CARPOMETACARPAL JOINT FOR OSTEOARTHRITIS

Presenter: Mia Qin, MD



**Figure 2.** Patient rating of post-operative pain improvement

### DISCUSSION:

Our results suggest that there is a significant reduction in thumb CMC pain and improvement in functionality after thumb CMC denervation. However, there is variability in patient reported effectiveness. Figure 2 highlights around ¼ of patients reported 0% improvement, ¼ noted 100% improvement, and half were in between. Other studies have demonstrated similar overall effectiveness of the procedure without the granularity of data suggesting variability.<sup>2-4</sup> Potential sources of this variability include anatomic variation in CMC joint capsule innervation as well as nerve re-growth post-operatively. Despite this variability, our results indicate that CMC denervation does provide statistically significant pain reduction for patients. Elucidating a means to pre-operatively identify patients that will have success from CMC denervation in future studies will maximize the benefits of the procedure.

### REFERENCES:

1. Yuan F, Oluseyi,, et al. *J Hand Surg Am.* 42(2):104-112, 2017
2. Tuffaha SH, et al. *J Hand Surg Am.* 44(1):64.e1-64.e8, 2019
3. Donato D, et al. *World Neurosurg.* 122:e1374-e1380, 2019
4. Rath R, et al. *Hand Surg Rehabil.* 42(1):51-55, 2023

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# POSTER PRESENTATIONS

9:45 AM - 10:35 AM

FRANKLIN AND HAMILTON ROOMS



MOUNT CARMEL



**THE OHIO STATE UNIVERSITY**

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WEXNER MEDICAL CENTER



**OhioHealth**



*Paul Alvarez,  
MD is a resident  
in Orthopaedics at  
The Ohio State  
University*

## DEFORMITY CONSIDERATIONS AFTER CERVICAL LAMINOPLASTY: A SYSTEMATIC REVIEW

Authors: Joseph Drain, MD Paul M. Alvarez, MD, William R. Spiker, MD, Elizabeth Yu, MD

Presenter: Paul Alvarez, MD

### INTRODUCTION:

Cervical laminoplasty has emerged as a viable alternate to both cervical laminectomy and laminectomy-fusion for treatment of cervical myelopathy. Similar to laminectomy and laminectomy-fusion, laminoplasty is an indirect, posterior-based decompression strategy for the cervical spine. It reduces but spares motion; unlike laminectomy-fusion, it does not require surveillance for postoperative pseudoarthrosis and, perhaps in consequence, has a lower infection and reoperation rate than laminectomy-fusion. Similar to laminectomy, the concern for post-operative sagittal alignment changes is high. Avoiding kyphosis in any indirect, posterior-based decompression surgery is believed to be critical because kyphosis may compromise the cord's ability to float away from anterior-based impingement. Furthermore, cervical kyphosis is associated with loss of horizontal gaze, strain on neck extensor musculature, pain, and disability. The purpose of this review is to evaluate laminoplasty in the context of cervical deformity, including its incidence, diagnosis, impact, and potential prevention strategies.

### METHODS:

PubMed articles in English pertaining to deformity after cervical laminoplasty were searched using all possible combinations of the following keywords: "cervical laminoplasty", "kyphosis", "cervical deformity", "cervical myelopathy", "cervical fusion", and "laminectomy". This search yielded more than 100 references. Of these results, studies focused on the topic of interest were isolated. From this collection, 34 articles that had higher level of evidence (I-IV), focused on outcomes and complications after treatment of cervical myelopathy with cervical laminoplasty were chosen for this review.

### RESULTS:

#### *Post-Operative Sagittal Alignment Changes*

The incidence of conversion from preoperative lordosis to postoperative kyphosis varies in the literature, ranging from 5.2% and 7.2% to between 10-11.3%.

#### *Radiographic Predictors of Post-Operative Sagittal Alignment*

Prior research found a preoperative lordosis less than 10° to be a statistically significant predictor for the development of postoperative kyphosis; those with preoperative lordosis greater than 10° had a 4.8% risk of developing postoperative kyphosis compared to a 27.2% risk for those with lordosis less than 10°. Increasing T1 slope predicted loss of lordosis after laminoplasty. A cut-off value of 29° for T1 slope was suggested as patients with a T1 slope greater than this were exposed to a greater risk of the development of postoperative kyphosis. In addition, increasing SVA may predict postoperative kyphosis and explain the development of lordosis in patients with normal preoperative lordosis but sagittal imbalance.

#### *Impact of Kyphosis on Outcomes*

Patients with a preoperative neutral or lordotic cervical alignment, defined as a C2-7 angle less than 0° were statistically more likely to have a good outcome than those with kyphosis. They also found the local kyphosis angle plus clinical factors like pre-op JOA scores and signal change on

*Continued on Next Page*



## DEFORMITY CONSIDERATIONS AFTER CERVICAL LAMINOPLASTY: A SYSTEMATIC REVIEW

Presenter: Paul Alvarez, MD

MRI predicted outcomes. Multivariate analysis confirmed that local kyphosis predicted poor outcomes with an odds ratio of 6.69 per 10° of local kyphosis, and the maximum acceptable local kyphosis angle was 13° in cords without signal change versus 5° in those with cord signal change.

### DISCUSSION:

Laminoplasty can reduce preoperative lordosis to a variable degree; between 5.2-11.3% of patients with a lordotic alignment pre-operatively will convert to a kyphotic alignment. After completion of our review, a surgeon can minimize risk of causing a clinically significant reduction in lordosis by:

- Screening Out Patients Based on Radiographic Parameters
  - o Minimal Pre-Operative Lordosis
  - o Large T1 slope
  - o Positive Sagittal Balance
  - o High Local Kyphosis Angles
  
- Operative Technique:
  - o Spare semispinalis and all C2 muscle attachments
  - o Exclusion of C3 when possible
  - o Hybridizing construct with a C3 laminectomy and C4-distal laminoplasty
  
- Post-Operative Protocol:
  - o Minimal Collar Wear
  - o Early Rehabilitation Exercises

### REFERENCES:

1. Lee, et al. *J Neurosurg Spine*. Vol#24:100-107, 2016.
2. Yoon, et al. *Spine*. Vol#38:183-194, 2013.
3. Miyamoto, et al. *Eur Spine*. Vol#23:341-346, 2014.

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### DISCLOSURES:

None of the authors included within the study have any financial conflicts of interest to disclose.



*Connor Hoge,  
MD is a resident  
in Orthopaedics at  
The Ohio State  
University*

## **WHAT PSYCHOLOGICAL FACTORS IMPACT RETURN TO SPORTS FOLLOWING SURGICAL INTERVENTION FOR SHOULDER INSTABILITY?: A SYSTEMATIC REVIEW**

Authors: David Gibbs, BS, Noah Mallory, BS; Connor Hoge, MD; Grant Jones, MD  
Julie Bishop, MD; Gregory Cvetanovich, MD; Ryan Rauck, Gregory  
Presenter: Connor Hoge, MD

### **INTRODUCTION:**

Identification of the multifactorial influences associated with return to sport (RTS) is of significant clinical utility. Recent advances have begun to identify the non-physical factors facilitating successful RTS, yet little is currently known regarding psychological factors and RTS following shoulder instability surgery.<sup>1</sup>

We hypothesized that psychological factors would be reported in the literature as critical elements influencing a patient's RTS.

### **METHODS:**

Clinical studies reporting on the psychological determinants of RTS for patients who had surgery for shoulder instability between 1996 and 2022 were identified from MEDLINE, Embase, and Cochrane databases. The PRISMA guidelines with the PRISMA checklist were appropriately applied. Demographic, clinical, and psychometric properties were extracted for pooled weighted analysis.

Due to the heterogeneity of reported outcome data, a formal meta-analysis was impossible to conduct, so weighted analysis was performed after patients were pooled across included studies. Statistics were primarily descriptive, and each study was analyzed qualitatively.

### **RESULTS:**

969 studies were screened with 24 (2.5%) meeting inclusion. Of the 2135 included patients, the mean age was 26.0 (17.4-35.5) and 1809 (84.7%) were male. Mean time for RTS was 6.8 (3.7-11.9) months.

There was a 76.3% rate of any RTS, and of the 1212 patients that reported level of play at return, 305 (25.2%) were unable to perform at their prior level. Psychological reasons were cited by 85% (n=360) of patients who did not RTS. Fear of reinjury was the most common reason (n=154, 42.8%); other psychological factors included lack of confidence (n=46, 12.8%), anxiety (n=45, 12.5%), depression (n=44, 12.2%), psychosocial factors (n=48, 13.3%), and lack of interest (n=23, 6.4%).

The Shoulder Instability Return to Sport after Injury, Western Ontario Shoulder Instability Index, Quick Inventory of Depressive Symptoms Self Report, Degree of Shoulder Involvement in Sports, Tampa Scale of Kinesiophobia-11, and Veterans Rand-12 were reported measures for assessing psychology and RTS.

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## WHAT PSYCHOLOGICAL FACTORS IMPACT RETURN TO SPORTS FOLLOWING SURGICAL INTERVENTION FOR SHOULDER INSTABILITY?: A SYSTEMATIC REVIEW

Presenter: Connor Hoge, MD

**Table 1 – Psychological Factors and Return to Play**

Time to return to play, mean (range), mo	6.8 (3.7-11.9)
Studies reporting return-to-sport rate, n	20
Total No. of patients	1784
Patients returning to sport, n (%)	1361 (76.3)
Patients not returning to sport, n (%)	423 (23.7)
Studies reporting return to prior level, n	14
Total No. of patients with return level of play data	1212
Patients returning to sport, but not returning to prior level, n (%)	305 (25.2)
Patients with psychological reasons for not returning to sport, n (%)	360 (85.1)
Studies reporting surgery-specific return-to-sport rate, n	15
Total No. of patients	1532
Arthroscopic labral repair patients returning to sport, n (%)	703/921 (76.3)
Open labral repair/capsular shift patients returning to sport, n (%)	57/84 (67.9)
Open bone block (Latarjet) patients returning to sport, n (%)	388/527 (73.6)

**Table 2 – Patient-Cited Factors Affecting RTS**

Factors affecting RTS, n (%)	Patients (n=360)	Studies (n=15)
Anxiety	45 (12.5)	2 (13.3)
Depression	44 (12.2)	1 (6.7)
Fear of reinjury	154 (42.8)	8 (53.3)
Lack of confidence in shoulder	46 (12.8)	4 (26.7)
Lack of interest/motivation	23 (6.4)	3 (20.0)
Psychosocial	48 (13.3)	6 (40.0)
<b>Factors predicting RTS</b>		
<b>Preoperative</b>	Social Support Mood (anxiety, depression) Preoperative WOSI emotion Perceptions and Expectations of Surgery	
<b>Postoperative</b>	Subjective shoulder instability (SIRSI, TSK-11.) Risk taking behavior & Fear of reinjury (WOSI, DOSIS) Depression & anxiety (VR-12 mental health, QIDS-SR16)	

### DISCUSSION:

Psychological factors play an important role in RTS after shoulder instability surgery. Fear of reinjury was the most commonly reported impediment to RTS. The psychological characteristics identified through this review may be incorporated into future RTS protocols seeking to address resilience and non-physical factors associated with RTS.

This study is, to our knowledge, the first systematic review of the literature identifying psychological factors associated with return to sport of patients undergoing surgery for shoulder instability. This review did not discriminate based upon the specific type of surgical intervention, and we sought to collect and quantify objective data from the included studies (demographics, number of dislocations, etc.) We feel that this study contributes a well-designed, quality review of the currently available literature in a growing area of orthopedic research and innovation.

### REFERENCES:

1. Memon M, et al. Return to sport following arthroscopic Bankart repair: a systematic review. *J Shoulder Elbow Surg.* Jul 2018;27(7):1342-1347. doi:10.1016/j.jse.2018.02.044

**ACKNOWLEDGEMENTS:** None

**DISCLOSURES:** None



*Erryk Katayama  
BA is a 1st Year  
Medical Student  
at The Ohio State  
University College  
of Medicine*

## COMPARISON OF FUNCTIONAL POST-OPERATIVE OUTCOMES IN TRAUMATIC AND NONTRAUMATIC ARTHROSCOPIC ROTATOR CUFF REPAIRS

Authors: Erryk Katayama BA, John Barnett BS, Akshar Patel BS, Andrew Stevens BS, Grant Jones MD, Gregory Cvetanovich MD, Julie Bishop MD, Ryan Rauck, MD  
Presenter: Erryk Katayama, BA

### **INTRODUCTION:**

Rotator cuff (RC) tears are among the most common causes of shoulder pain and dysfunction, comprising around 50% of all shoulder joint pathologies.<sup>1</sup> Within the aging population, it is expected that the prevalence of RC tears will continue to increase annually.<sup>1</sup>

Atraumatic tears are believed to be a consequence of aging, occurring when chronic tendon degeneration progresses into partial- or full-thickness tears of the RC over time.<sup>2</sup> Traumatic tears are the result of high-energy injuries that cause full-thickness tears and acute functional deficits to the shoulder.<sup>2</sup> While surgery is usually indicated for traumatic RC tears, there is a lack of consensus among orthopedic care teams on the appropriate standard approach for treating degenerative RC tears.<sup>3</sup>

To date, the effects of traumatic or atraumatic mechanisms of injury on post-operative RCR outcomes remains ill-defined. The objective of this study is to examine whether or not differences exist in surgical outcomes following traumatic and atraumatic RC tears following arthroscopic RCR.

### **METHODS:**

Institutional records were used to identify patients who underwent arthroscopic RCR in 2019-2020 (via CPT code 29827). We analyzed pre-operative and post-operative functional forward elevation, external rotation, and internal rotation range of motion (ROM), strength of the affected joint, along with patient satisfaction Single Assessment Numeric Evaluation (SANE) score on patients with at least 2 years of follow-up data.

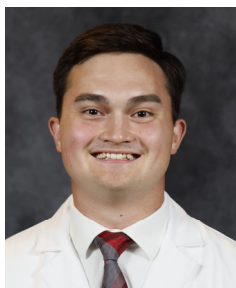
Continuous variables were analyzed using the Wilcoxon Rank-Sum test, ordinal variables were analyzed via univariable ordered logistic regression, and categorical variables were analyzed using the Chi-squared test. All statistical tests were conducted as two-sided. Statistical analyses were performed using Stata/SE v17.0.

### **RESULTS:**

Demographically, males were significantly more likely to sustain traumatic RC tears. There was no significant difference in patient age or follow-up time between traumatic and nontraumatic cohorts. Nontraumatic tears took over three times longer to receive surgical intervention after onset of pain.

Preoperative physical exam shoulder assessments revealed that traumatic injuries present as functionally worse than nontraumatic injuries.

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## COMPARISON OF FUNCTIONAL POST-OPERATIVE OUTCOMES IN TRAUMATIC AND NONTRAUMATIC ARTHROSCOPIC ROTATOR CUFF REPAIRS

Presenter: Erryk Katayama, BA

	Traumatic		Nontraumatic		P-value
	Sample size	Measurement	Sample size	Measurement	
Forward elevation ROM	52	130° ± 48°	45	152° ± 25°	<b>0.036</b>
External rotation ROM	52	49° ± 17°	45	55° ± 16°	0.076
Internal rotation ROM	49	L4	44	L3	<b>0.033</b>
Forward elevation strength	51	4+/5	45	5/5	<b>0.024</b>
External rotation strength	51	5/5	45	5+/5	0.055
Internal rotation strength	51	5/5	45	5/5	0.101

Cohort comparison of postoperative measurements demonstrated no significant difference in outcomes.

	Traumatic		Nontraumatic		P-value
	Sample size	Measurement	Sample size	Measurement	
Forward elevation ROM	51	158° ± 19°	47	153° ± 28°	0.433
External rotation ROM	51	53° ± 16°	47	50° ± 15°	0.332
Internal rotation ROM	36	L2	26	L2	0.703
Forward elevation strength	43	5+/5	39	5+/5	0.547
External rotation strength	43	5+/5	39	5+/5	0.893
Internal rotation strength	43	5+/5	39	5+/5	0.885
SANE score	28	78 ± 13	21	79 ± 11	0.780

**CONCLUSION:**

Operative approach had good outcomes regardless of etiology – surgery was successful in improving ROM, strength, and quality of life through restoration of function. Orthopedic care teams should consider arthroscopic RCR as an effective treatment option for patients who are able to tolerate the procedure.

**REFERENCES:**

Zhao J, et al. *J Shoulder Elbow Surg.* 30(11):2660–70, 2021.  
 Godshaw BM, et al. *Orthop J Sport Med.* 1;10(10):23259671221126550, 2022  
 Keener JD, et al. *J Am Acad Orthop Surg.* 27(5), 2019

**ACKNOWLEDGEMENTS:** None

**DISCLOSURES:** None



*Scott Hyland,  
DO is a resident  
in Orthopaedics at  
Doctors Hospital  
Columbus*

## **POSTEROLATERAL FEMORAL EPISIOTOMY FOR EXPLANTATION: CASE REPORT**

Authors: Scott Hyland, DO, Daniel DeGenova, DO, Sanjay Mehta, DO  
Presenter: Scott Hyland, DO

### **Introduction:**

Removal of implants is a complex component of revision arthroplasty and this has become an area of interest for arthroplasty surgeons as there continues to be advancement in techniques and instrumentation.

This case provides a technique which may be utilized in the removal of femoral implants in total hip arthroplasty.

### **Case Description:**

This is a 48-year-old male with past medical history of type 2 diabetes mellitus, depression, hypertension, hyperlipidemia who presented for revision arthroplasty following an infected total hip arthroplasty (THA). Patient had a draining sinus 1 month following primary THA after initial treatment of a traumatic hip dislocation and posterior wall acetabular fracture treated with open reduction internal fixation (ORIF).

A posterior approach was utilized for the procedure. Extensive irrigation and debridement was conducted in addition to obtaining intra-operative tissue cultures. Femoral head component (Dual Mobility head; Zimmer Biomet; Warsaw, IN) was removed. Spline tapered modular stem with proximal body (Arcos 13x150 mm spline tapered stem; 50 mm high offset cone proximal body) was unable to be removed due to set screw stripping. Hooked extractor and Shukla Universal extractor were both unsuccessful in removing the femoral implant. Diaphyseal prosthesis press fit and early osteointegration required further osteoinvasive measures, therefore, a single cut femoral episiotomy along the posterolateral cortex approximately 10 cm in length was performed using a saw blade. No connecting second limb was performed which would be necessary to complete an extensive trochanteric osteotomy (ETO). Implant removal was accomplished following femoral episiotomy. The acetabular component and remaining screws were subsequently removed without complication.

The hip joint was then irrigated with acetic acid solution (Bactisure Wound Lavage; Zimmer Biomet product) and pulsatile lavage. Betadine was subsequently used to soak the hip joint for approximately 5 minutes. Iricept (Chlorhexidine gluconate 0.05% in sterile water) was also placed in the wound and allowed to set for 1 minute. At this time, calcium sulfate beads mixed with Vancomycin and Gentamycin. Once beads were in place, the wound was closed in standard fashion using monofilament absorbable suture and superficially with skin staples.

Post-operative restrictions consisted of non-weightbearing of the operated extremity and 6 weeks of intravenous antibiotic therapy for *Staphylococcus aureus*.

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## POSTEROLATERAL FEMORAL EPISIOTOMY FOR EXPLANTATION: CASE REPORT

Presenter: Scott Hyland, DO

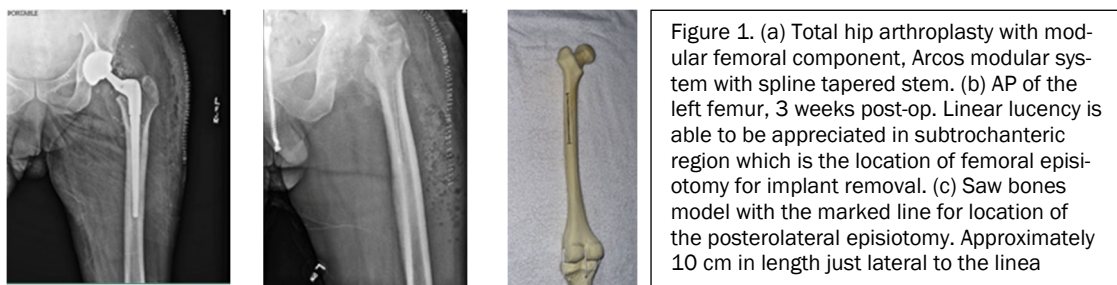


Figure 1. (a) Total hip arthroplasty with modular femoral component, Arcos modular system with spline tapered stem. (b) AP of the left femur, 3 weeks post-op. Linear lucency is able to be appreciated in subtrochanteric region which is the location of femoral episiotomy for implant removal. (c) Saw bones model with the marked line for location of the posterolateral episiotomy. Approximately 10 cm in length just lateral to the linea

### Discussion:

Utilization of different methods for implant removal may be considered in arthroplasty. The use of a single episiotomy provides a component of simplicity which can be part of the surgeon's armamentarium without sacrificing the option of transitioning surgical plan to a more extensive osteotomy. Use of this technique also negates the necessity for internal fixation since this provides minimal compromise to the structural integrity of the bone. Episiotomy may serve as an effective method when implants have minimal bony in-growth or osseointegration which may take up to 4-12 weeks. This serves as a less osseous insulting method for extraction, which may provide benefit for subsequent revision.

### References:

1. Masri, Bassam A. MD, FRCSC; Mitchell, Philip A. FRCS(Tr&Orth); Duncan, Clive P. MD, FRCSC. Removal of Solidly Fixed Implants During Revision Hip and Knee Arthroplasty. *Journal of the American Academy of Orthopaedic Surgeons* 13(1):p 18-27, January 2005.
2. Taylor, J. W. and Cecil H. Rorabeck. "Hip revision arthroplasty. Approach to the femoral side." *Clinical orthopaedics and related research* 369 (1999): 208-22 .
3. Anil U, Singh V, Schwarzkopf R. Diagnosis and Detection of Subtle Aseptic Loosening in Total Hip Arthroplasty. *J Arthroplasty*. 2022 Aug;37(8):1494-1500. doi: 10.1016/j.arth.2022.02.060. Epub 2022 Feb 19. PMID: 35189292.
4. Masri BA, Campbell DG, Garbuz DS, Duncan CP. Seven specialized exposures for revision hip and knee replacement. *Orthop Clin North Am*. 1998 Apr;29(2):229-40. doi: 10.1016/s0030-5898(05)70321-7. PMID: 9553568.
5. Pierson JL, Jasty M, Harris WH. Techniques of extraction of well-fixed cemented and cementless implants in revision total hip arthroplasty. *Orthop Rev*. 1993 Aug;22(8):904-16. PMID: 8265229.
6. Khanuja, Harpal S. MD<sup>1</sup>; Vakil, Jeffrey J. MD<sup>2</sup>; Goddard, Maria S. MD<sup>1</sup>; Mont, Michael A. MD<sup>1</sup>. Cementless Femoral Fixation in Total Hip Arthroplasty. *The Journal of Bone & Joint Surgery* 93 (5):p 500-509, March 2, 2011. | DOI: 10.2106/JBJS.J.00774
7. Albrektsson T, Brånemark PI, Hansson HA, Lindström J. Osseointegrated titanium implants. Requirements for ensuring a long-lasting, direct bone-to-implant anchorage in man. *Acta Orthop Scand*. 1981;52(2):155-70. doi: 10.3109/17453678108991776. PMID: 7246093.

**Disclosures:** Neither of the authors have any financial conflicts of interests or disclosures



*Azeem Malik,  
MBBS is a  
PGY2 resident in  
Orthopaedics at  
The Ohio State  
University*

## INTER-SPECIALTY VARIATION IN PERI-OPERATIVE HEALTHCARE RESOURCE UTILIZATION FOR CARPAL TUNNEL RELEASE

Authors: Azeem Tariq Malik, MBBS, James S Lin, MD, Ronald Brown, MD, Sonu Jain, MD, Ryan Schmucker, MD, Hisham Awan, MD, Safdar Khan, MD, Kanu Goyal, MD

Presenter: Azeem Malik, MBBS

### INTRODUCTION:

Carpal tunnel release (CTR), whether done endoscopically or open, remains one of the most common procedures done within the realm of hand surgery. Although, CTRs are typically performed by orthopaedic surgeons or plastic surgeons, neurosurgeons and general surgeons are also known to perform this procedure. With the advent of prospective payment models in hand surgery, there has been a push towards minimizing variation in resource utilization associated with this procedure. The purpose of the current study was to investigate whether any inter-specialty variation exists in peri-operative healthcare resource utilization for CTRs.

### METHODS:

The 2010 to 2021 PearlDiver Mariner Patient Claims Database, an all-payor claims database, was queried using Current Procedural Terminology codes to identify patients undergoing open and endoscopic primary carpal tunnel releases. Physician specialty IDs were used to identify the operative specialty of the surgeon – orthopaedic vs. plastic vs. general surgery vs. neurosurgery. Healthcare resource utilization was broadly categorized into pre-operative and post-operative use. Pre-operative resource use included physical/occupational therapy, electrodiagnostic studies (EDS), opioids, oral steroids, steroid injections and NSAIDs within 6 months prior to surgery. Additional operative resource uses that were assessed included utilization of antibiotic prophylaxis and peripheral nerve blocks prior to surgery. Post-operative resource use included use of muscle relaxants, gabapentin, opioids, formal physical/occupational therapy and emergency department (ED) visits within 30 days of the surgery. Multivariate logistic regression analysis was used to identify whether there was any inter-specialty variation between the use of the beforementioned healthcare resources.

### DISCUSSION:

A total of 908,671 patients undergoing carpal tunnel release were included in the study, out of which 556,339 (61.2%) were by orthopaedic surgeons, 297,047 (32.7%) by plastic surgeons, 44,118 (4.9%) by neurosurgeons and 11,257 (1.2%) by general surgeons. Significant variation between different specialties were noted with regards to both pre- and post-operative healthcare resource utilization. In comparison to orthopaedic surgeons, patients treated by plastic surgeons were less likely to have received opioids (OR 0.94 [95% CI 0.92-0.96];  $p < 0.001$ ), NSAIDs (OR 0.93 [95% CI 0.92-0.94];  $p < 0.001$ ), oral steroids (OR 0.94 [95% CI 0.93-0.96];  $p < 0.001$ ) and pre-operative antibiotic prophylaxis (OR 0.66 [95% CI 0.64-0.68];  $p < 0.001$ ), but were more likely to have received peripheral/regional nerve blocks (OR 1.59 [95% CI 1.24-2.03];  $p < 0.001$ ) on day of surgery, steroid injections (OR 1.41 [95% CI 1.39-1.43];  $p < 0.001$ ) and electrodiagnostic studies (OR 1.04 [95% CI 1.03-1.05];  $p < 0.001$ ) within 6 months prior the surgery. Patients treated by neurosurgeons were more likely to have received pre-operative opioids (OR 1.37 [95% CI 1.32-1.43];  $p < 0.001$ ), gabapentin (OR 1.70 [95% CI 1.65-1.74];  $p < 0.001$ ), oral steroids (OR 1.13 [95% CI 1.11-1.16];  $p < 0.001$ ), pre-operative antibiotic prophylaxis (OR 1.63 [95% CI 1.56-1.71];  $p < 0.001$ ), electrodiagnostic studies (OR 1.40 [95% CI 1.37-1.43];  $p < 0.001$ ) and formal pre-operative physical/occupational therapy (OR 1.10 [95% CI 1.06-1.13];  $p < 0.001$ ), but were less likely to have received steroid injections (OR 0.21 [95% CI 0.20-0.23];  $p < 0.001$ ). Patients treated by general surgeons were less likely to receive oral steroids (OR 0.80 [95% CI 0.76-0.84];  $p < 0.001$ ), steroid injections (OR 0.54 [95% CI 0.49-0.59];  $p < 0.001$ ), electrodiagnostic studies (OR 0.90 [95% CI 0.86-0.94];

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## INTER-SPECIALTY VARIATION IN PERI-OPERATIVE HEALTHCARE RESOURCE UTILIZATION FOR CARPAL TUNNEL RELEASE

Presenter: Azeem Malik, MBBS

p<0.001) pre-operative formal physical therapy (OR 0.74 [95% CI 0.60-0.79]; p<0.001), pre-operative antibiotic prophylaxis (OR 0.89 [95% CI 0.85-0.94]; p<0.001), but were more likely to prescribe gabapentin (OR 1.17 [95% CI 1.10-1.25]; p<0.001). In comparison to orthopaedic surgeons, patients treated by plastic surgeons were less likely to have an ED visit (OR 0.94 [95% CI 0.92-0.97]; p<0.001), but more likely to receive formal physical therapy (OR 1.41 [95% CI 1.39-1.43]; p<0.001) within 30 days after the surgery. Patients treated by neurosurgeons were more likely to receive opioids (OR 1.33 [95% CI 1.28-1.38]; p<0.001) but were less likely to receive formal physical therapy (OR 0.48 [95% CI 0.46-0.51]; p<0.001). Lastly, patients treated by general surgeons had higher number of ED visits (OR 1.26 [95% CI 1.15-1.37]; p<0.0010, were less likely to receive formal physical therapy (OR 0.60 [95% CI 0.56-0.65]; p<0.001).

### CONCLUSION:

There exists significant variation in peri-operative healthcare resource utilization between different surgeon specialties. Understanding reasons behind such variation would be paramount in minimizing differences in how care is practiced for minor elective hand procedures. Cross-training of different specialties may be warranted to better control variation and improve value of hand surgical care.

### REFERENCES:

1. Greenfield, P.T., et al., The Preoperative Cost of Carpal Tunnel Syndrome. *J Hand Surg Am*, 2022. 47(8): p. 752-761 e1.
2. Delgado, C.N., et al., Variation in Postoperative Opioid Prescribing Among Upper-Extremity Surgery Providers. *J Hand Surg Glob Online*, 2021. 3(1): p. 17-23.

**ACKNOWLEDGEMENTS/DISCLOSURES:** None



*Parker Prusick, MD is a fellow in Surgery of the Spine at The Ohio State University*

## **CERVICAL TOTAL DISC REPLACEMENT: A 10-YEAR SINGLE-CENTER EXPERIENCE**

Authors: Nazihah S Bhatti BS, Amogh Iyer BSE, Usman Khan, Hania Shahzad MBBS, Parker Prusick MD, Safdar Khan MD

Presenter: Parker Prusick, MD

### **Background**

cTDR has been used for the last decade to treat several cervical spine conditions, including radiculopathy, myelopathy, and disc herniation. cTDR can be seen as an alternative to ACDF, as it aims to preserve segmental mobility, reduce the rate of adjacent segment disease (ASD), and improve patient outcomes. ACDF remains a popular treatment, but ASD remains a concern postoperatively. cTDR

### **Purpose**

This study evaluated patients who have received a cTDR. The primary outcome was to evaluate the incidence of reoperation and adverse events following the procedure. The secondary outcomes were to analyze the most common types of pre-operative diagnoses and procedures.

### **Study Design**

This was a retrospective chart review evaluating patients who have undergone a cTDR in the last 10 years. Data collected includes demographics, surgical details, and follow-ups at 1, 3, 6, and 12 months.

### **Patient Sample**

Electronic medical records at The Ohio State University were queried from 2011-2021 for patients who received a cTDR. This sample also included patients who underwent a cTDR in conjunction with another procedure, for example an ACDF at an adjacent level.

### **Outcome Measures**

Outcome measures included incidence of reoperation and adverse events.

### **Methods**

We reviewed 49 charts of patients who had undergone a cTDR in the past 10 years at this institution. Demographic, surgical and follow-up data was analyzed.

### **Results**

Analysis of demographic information showed no significant difference between patients who underwent reoperation and those who did not. 27% of all patients underwent a single level cTDR, and the most common operative levels were C5-C6 and C6-C7. Statistical analysis showed that 8% of the patient population underwent a reoperation. 15% of all patients reported an adverse event at 1 month (Table 2).

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## CERVICAL TOTAL DISC REPLACEMENT: A 10-YEAR SINGLE-CENTER EXPERIENCE

Presenter: Parker Prusick, MD

### Conclusions

cTDR is a procedure that aims to provide less restriction for patients, while still improving symptoms. cTDR can be seen as an alternative to ACDF, and reporting outcomes can serve as a guideline for surgical decision making. This data showed a reoperation rate of 8%, with no significant differences in demographics of these patients.

Table 1. Patient Demographics stratified by Re-Operation Status				
		Reoperation?		Total
		Yes	No	
Age in Years, mean, (SD)		41 (7.43)	43.33 (8.72)	43.29 (8.61)
Sex	Male	2	25	27
	Female	2	19	21
Race	White	4	40	44
	Black	0	2	2
	Asian	0	2	2
BMI, mean (SD)		30.42 (4.78)	29.00 (7.45)	29.11 (7.24)
Smoking Status	Current	0	10	10
	Former	2	11	13
	Never	2	23	25



*Harish Chinnasamy, BS is a 2023 graduate of The Ohio State University, He is currently applying to medical school*

## PRESENCE OF CONCOMITANT OSTEOCHONDRAL LESIONS OF THE TALUS IN ANTERIOR TALOFIBULAR LIGAMENT INJURIES: A RETROSPECTIVE REVIEW

Authors: Christian Curatolo, MD, Andrew Rust, BS, Harish Chinnasamy, Kevin Martin, DO, FAAOS, FAANA  
 Presenter: Harish Chinnasamy, BS

### INTRODUCTION:

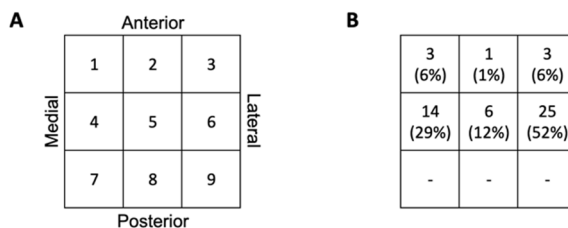
Osteochondral lesions of the talus are a common cause of persistent ankle pain following ankle trauma. Undetected injuries can result in poor functional outcomes and significantly impact quality of life. Classically, these lesions are diagnosed via ankle MRI if not apparent on plain radiographs. Operative management of osteochondral lesions of the talus include microfracture, drilling, grafting, and chondroplasty. The literature is sparse regarding the incidence of osteochondral lesions of the talus in lateral ankle instability. Additionally, performing ankle arthroscopy during operative management of ankle instability is not yet standard of care. In this study, we aim to characterize the prevalence, injury pattern, and outcomes of osteochondral lesions identified arthroscopically in patients with lateral ankle instability undergoing a suture-tape augmented Broström procedure.

### METHODS:

A retrospective chart review of patients who underwent a suture-tape augmented Broström procedure with arthroscopic evaluation of the talar trochlea from August, 2020 to January, 2023 was conducted. Our inclusion criteria consisted of MRI confirmation of ATFL injury, a positive anterior drawer, and failure of non-operative management. Patients who had posterior arthroscopic debridement, peroneal tendon repair, syndesmosis repair, or calcaneal osteotomies were excluded from our study. Our primary outcome was the visual analog score (VAS) at the patient’s final follow up visit. Secondary outcomes included post-operative complications and location of lesion.

### DATA AND RESULTS:

137 patients were identified that met our inclusion criteria. Our patients included 40 males and 97 females with a mean age of 36 + 12 (range, 18-68) years. Of the patients that underwent a suture-tape augmented Broström for ATFL injury, 47 (34%) patients had a concomitant osteochondral lesion of the talus. The average area of the lesion was 37 + 41 (range, 4 - 140) mm<sup>2</sup>. The location of the OLTs by talar cartilage zone is described in **Figure 1**.



**Figure 1A.** Describes the zone classification of osteochondral lesions of the talus.  
**Figure 1B.** Describes the counts and associated percentages of total OLTs at that cartilage zone.

The most common talar cartilage zone for the lesion was zone 6; there were 25 (52%) lesions at zone 6, 14 (29%) lesions at zone 4, 6 (12%) lesions at zone 5, 3 (6%) lesions at zone 3, 3 (6%) lesions at zone 1, and 1 (2%) lesion at zone 2. Of the 48 lesions identified, 25 (53%) were managed with microfracture, 5 (11%) were managed with bone grafting, 3 (6%) were managed with chondroplasty, and 14 (30%) received no additional intervention. Larger lesions were managed with grafting and microfracture. Smaller lesions were managed with chondroplasty or no additional

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## PRESENCE OF CONCOMITANT OSTEOCHONDRAL LESIONS OF THE TALUS IN ANTERIOR TALOFIBULAR LIGAMENT INJURIES: A RETROSPECTIVE REVIEW

Presenter: Harish Chinnasamy, BS

intervention. The average VAS at final follow up and follow up duration for osteochondral lesions was  $0.83 \pm 1.22$  (range, 0 – 6) and  $10 \pm 7$  (range, 6-32) weeks, respectively. There was no difference in VAS or follow up duration in patients who had an osteochondral lesion and those who did not. There was also no difference based on what surgical treatment was used to treat the osteochondral lesion. There was a trend towards patients with osteochondral lesions who did not receive additional intervention having a higher VAS score at final follow up visit, but this trend was not significant. Demographic factors were not significantly different between patients with a cartilage injury versus those without

### DISCUSSION:

Our data suggests that ankle arthroscopy should be strongly considered in surgical cases addressing lateral ankle instability to appropriately evaluate and treat cartilage injuries. Osteochondral lesions are a common finding in patients with ATFL injuries (34%). They most commonly occur in zone 6 of the talus. There was no significant difference in post-operative pain score or follow up duration in patients who had an osteochondral lesion versus those who did not.

### REFERENCES:

1. *Piscoya, et al. J Foot Ankle Surg. Vol#:* 61(2):390-395, 2022
2. *Acevedo, et al. Foot Ankle Int. Vol#:* 36(4):465-73, 2015
3. *Bruns, et al. Cartilage. Vol#:* 13:1380S-1401S, 2021

### ACKNOWLEDGEMENTS:

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### DISCLOSURES:

We have no financial disclosures.



*Thomas J. Utset-Ward is a Fellow in Musculoskeletal Oncology at The Ohio State University*

## IMPROVING OUTCOMES OF INTERCALARY ALLOGRAFT RECONSTRUCTIONS WITH PATIENT-SPECIFIC INSTRUMENTATION AND VIRTUAL SURGICAL PLANNING

Authors: Thomas J Utset-Ward, MD, Thomas Scharschmidt, MD

Presenter: Thomas J. Utset-Ward, MD

### INTRODUCTION:

We report our early experience with 3D-printed patient- and allograft-specific instrumentation for the resection and allograft reconstruction through a series of patients treated with intercalary resections of primary bone sarcomas. We describe pre-operative virtual planning and intraoperative techniques to best leverage this emerging technology. We aim to evaluate improvements in union, margin status and reduction in revision reconstruction with the use of 3D printed cutting guides. We hypothesize that margins and surgical outcomes including lower reoperation for revision reconstruction will improve with the use of patient and allograft specific 3D printed cutting guides.

### METHODS:

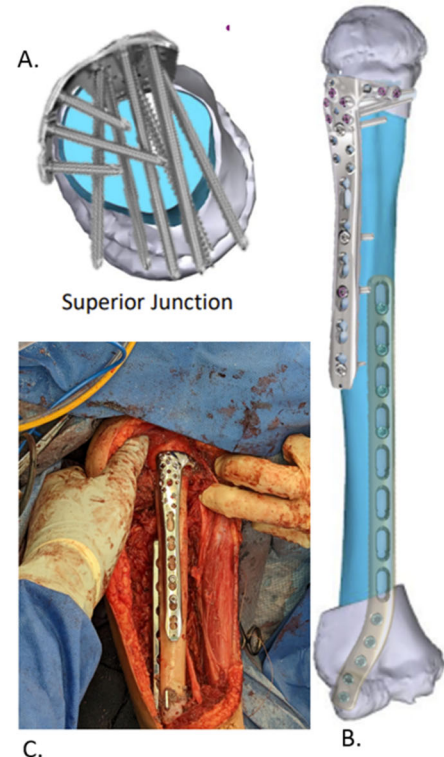
A case series of 20 patients who underwent intercalary resection and allograft reconstruction for primary bone sarcoma, including 12 patients treated with the use of custom 3D-printed cutting guides for the resection with matching cutting guides for the allograft, and 8 patients for which the guides were not used. Over a mean follow-up of 2.8 years, complications including non-union and revision reconstruction were collected in both groups.

### RESULTS:

Reconstructions using this innovative instrumentation more likely to create better junction fit (OR 1.62, 95% CI 1.18, 2.06] and a lower rate of revision reconstruction (14% vs 75%). Bone marrow margins were negative in all cutting guide cases, but positive in 2 of the free-handed osteotomy resections. We describe techniques to maximize allograft fit and plan physeal-sparing fixation by simulating and pre-selecting hardware as well as pre-contouring implants.

### DISCUSSION:

Our early experience with 3D-printed cutting guides for intercalary resection and reconstruction in primary bone sarcomas demonstrates the potential to improve resection and bone-allograft fit. Additionally, there are opportunities to improve virtual surgical planning, implant selection and preparation for intercalary resections and reconstructions.



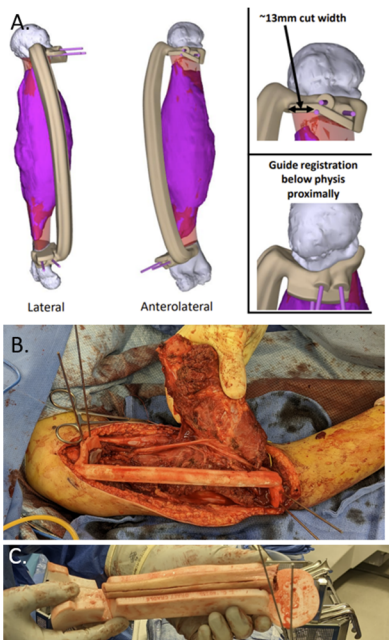
**Fig 1.** The process of patient and allograft specific cutting guide creation allows for additional virtual surgical planning including A. assessment of bone allograft junction B. testing atypical plates for C. physeal-sparing reconstructions

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## IMPROVING OUTCOMES OF INTERCALARY ALLOGRAFT RECONSTRUCTIONS WITH PATIENT-SPECIFIC INSTRUMENTATION AND VIRTUAL SURGICAL PLANNING

Presenter: Thomas J. Utset-Ward, MD



**Fig 2.** A. Virtual planning and design of the resection patient-specific cutting guide with additional planes and physeal-sparing cut of the proximal margin. B. Intraoperative photo following guide-assisted osteotomies and resection of the bone sarcoma C. Allograft specific cutting guide and cradle allowing proper preparation of the allograft.

**ACKNOWLEDGEMENTS:** None

**DISCLOSURES:** None



*Thomas J. Utset-Ward is a Fellow in Musculoskeletal Oncology at The Ohio State University*

## IS THERE A ROLE FOR RADIATION THERAPY IN THE TREATMENT OF SMALL INTERMEDIATE AND HIGH-GRADE SOFT TISSUE SARCOMAS OF THE EXTREMITIES?

Authors: Thomas J. Utset-Ward, MD, Azeem Tariq Malik, MBBS, L. Good, Thomas Scharschmidt, MD, John Alexander, MD

Presenter: Thomas J. Utset-Ward, MD

### **INTRODUCTION:**

Current National Comprehensive Cancer Network guidelines recommend considering omission of radiation therapy (RT) when possible, for high-grade soft tissue sarcomas (STS) <5cm (T1). We aimed to answer (1) does RT improve overall survival in T1 intermediate and high grade (G2, G3) STS and (2) what are current and recent trends for RT use for these tumors.

### **METHODS:**

This retrospective study spanned 2004-2017 National Cancer Database (NCDB) data. Patients with T1 G2 and G3 STS of the extremities were included. We identified patients who received neo-adjuvant RT, adjuvant RT or a combination. Cox-regression analyses were used to assess whether radiation therapy was associated with improved overall survival.

### **RESULTS:**

3,806 patients were included. 51% (1,958) patients received RT, 10% (388) neo-adjuvant, 38% (1,465) adjuvant, and 60 (1.6%) both. After adjustment for baseline demographics, treatment characteristics (facility type, surgical resection of primary or non-primary sites, margin status, chemotherapy) and tumor characteristics (grade and histology), we noticed no significant survival benefit of radiation therapy (HR 1.01 [0.88-1.16]; p=0.891). Further sensitivity analysis comparing neo-adjuvant (HR 1.20; p=0.135), adjuvant (HR 1.02 p=0.762) and combined neoadjuvant + adjuvant (HR 1.54; p=0.108), also did not show any significant benefit in terms of overall survival.

### **DISCUSSION:**

Radiation Therapy is used as a part of the treatment in 51% of patients with intermediate and high-grade STS <5cm. Although there may be a role for RT in select patients with T1 intermediate and high-grade STS, systematic use is called into question given the lack of an overall survival benefit.

### **ACKNOWLEDGEMENTS:**

None

### **DISCLOSURES:**

None



MOUNT CARMEL



**THE OHIO STATE UNIVERSITY**

WEXNER MEDICAL CENTER



**OhioHealth**



*John Barnett, BS is a rising 2nd Year Medical Student at The Ohio State University College of Medicine*

## THE COVID-19 PANDEMIC AND ARTHROSCOPIC ROTATOR CUFF REPAIR: WERE SURGICAL OUTCOMES NEGATIVELY AFFECTED?

Authors: John S. Barnett, BS, Akshar V. Patel, BS, Andrew Stevens, BS, Vikas Munjal, BS, Gregory Cvetanovich, MD, Grant Jones, MD, Julie Y. Bishop, MD, Ryan C. Rauck, MD

Presenter: John Barnett, BS

### INTRODUCTION:

Due to an aging population and previous literature suggesting the benefit of treating small tears early, the incidence of arthroscopic rotator cuff repair (RCR) has risen significantly over the last two decades. Further, the COVID-19 pandemic brought upon unprecedented changes in the post-operative management of surgical patients due to a shift forwards emergent orthopedic care and the cessation of elective treatment. We investigated whether patients who received an RCR in January-March 2020 had a difference in outcomes compared to patients who received it the previous year. We hypothesized that patients in 2020 will have decreased access to physical therapy due to the COVID-19 pandemic, and worse postoperative outcomes compared to 2019 patients.

### METHODS:

Institutional records were queried to identify patients who underwent an arthroscopic RCR between 1/1/19 to 3/17/19 and 1/1/20 to 3/17/20. Patients were divided into cohorts based on year of surgery. Demographics, range of motion, and physical therapy data were collected. Patients from the 2020 cohort were contacted by phone in October 2022 regarding their shoulder function. Univariate analysis of categorical data was performed using a Chi-square test or Fisher’s Exact test. Continuous data was analyzed using a 2-sample t-test or a Mann Whitney U test dependent on normality. Normality was determined using a Kolmogorov-Smirnov test. To compare variance between the two groups, an F-test for equality of variance was used.

### RESULTS:

Rotator cuff repairs done in 2019 had improvements in forward elevation (FE) (135° to 161°; p<0.01) and internal rotation (IR) (L4 to L1; p-value<0.01) whereas those done in 2020 did not improve their forward elevation (146° to 151°; p=0.42) or internal rotation (L3 to L2; p=0.29).

Table 1. Comparison of Patient Demographic Information

Cohort	2019 (n=51)	2020 (n=50)	p-value
Age (years)	56.8 ± 8.6	57.7 ± 10.3	0.79
Follow-Up (years)	1.10 ± 0.73	1.0 ± 0.59	0.38
% Male	56.8%	48.0%	0.54
% Traumatic RC tears	54%	43%	0.27
Time from Onset of Pain to RCR (days)	475 ± 671	236 ± 225	<b>0.05</b>

All significant p-values (p<0.05) are bolded.

Both cohorts showed improvements in rotator cuff strength following surgery. Patients in 2019 completed more physical therapy sessions (2019: 25.0; 2020: 16.7; p<0.01) and patients in 2020 experienced a significant delay before first physical therapy session (2019: 28.5 ± 11.9 days; 2020: 35.0 ± 16.5 days; p-value=0.03). Of the 2020 patients, 8% (4/50) did not initiate physical therapy, 16% (8/50) reported a delay in physical therapy, and 44% (22/50) reported that the COVID-19 pandemic affected their recovery. At final follow up, patients reported a SANE score of 78.2 ± 12.1 on the affected shoulder, 91.3 ± 10.4 on the unaffected shoulder, and a mean VAS pain score of 2.3 ± 1.8.

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## THE COVID-19 PANDEMIC AND ARTHROSCOPIC ROTATOR CUFF REPAIR: WERE SURGICAL OUTCOMES NEGATIVELY AFFECTED?

Presenter: John Barnett, BS

Table 2. Comparison of Postoperative Clinical Outcomes

Cohort	2019 (n=51)	2020 (n=50)	p-value
Forward Elevation (°)	161° ± 16°	151° ± 29°	0.05
External Rotation (°)	56° ± 12°	48° ± 18°	0.01
Internal Rotation	L1	L2	0.38
Strength – Forward Elevation	5/5	5/5	0.21
Strength – External Rotation	5/5	5/5	0.20
Strength – Internal Rotation	5/5	5/5	0.09

All significant p-values (p<0.05) are bolded.

### DISCUSSION:

Patients who follow the standard of care protocol after cuff tears have predictable outcomes after RCR. Patients who underwent arthroscopic RCR in early 2020 had a longer delay to starting PT, did less PT overall, but still had comparable range of motion and strength at final follow-up. Despite 44% of patients reporting a subjective delay in postoperative care, the cohort still achieved satisfactory outcomes when contacted 2.5 years later. This suggests that patients with suboptimal physical therapy after RCR may still achieve clinically significant improvements in shoulder function. The sample sizes were small, and thus the main hypothesis of this study would benefit from being conducted in a multi-center study.

### REFERENCES:

1. Colvin AC, et al. National trends in rotator cuff repair. *J. Bone Joint Surg. Am.* 2012 Feb 1;94(3):227–233.
2. Cvetanovich GL, et al. Establishing clinically significant outcome after arthroscopic rotator cuff repair. *J. Shoulder Elbow Surg.* 2019 May;28(5):939–948.
3. Fu MC, et al. Delay to Arthroscopic Rotator Cuff Repair Is Associated With Increased Risk of Revision Rotator Cuff Surgery. *Orthopedics* 2020 Nov 1;43(6):340–344.
4. Gallagher BP, et al. Early versus delayed rehabilitation following arthroscopic rotator cuff repair: A systematic review. *Phys. Sportsmed.* 2015 May;43(2):178–187.
5. Keener JD, et al. Rehabilitation following arthroscopic rotator cuff repair: a prospective randomized trial of immobilization compared with early motion. *J. Bone Joint Surg. Am.* 2014 Jan 1;96(1):11–19.



*Daniel DeGenova, DO is a resident in Orthopaedics at Doctors Hospital*

## TALAR NECK FRACTURE WITH MEDIAL BONE VOID TREATED WITH CERVICAL SPINE ALLOGRAFT

Authors: Daniel DeGenova, DO, Tung Dao, DPM, Ryan Stone, DPM, Ben Taylor, MD  
 Presenter: Daniel DeGenova, DO

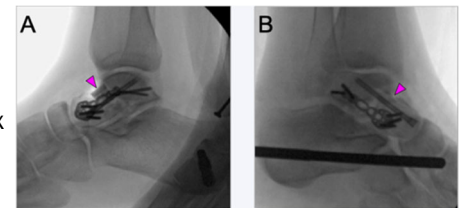
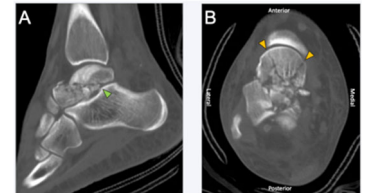
### **INTRODUCTION:**

Talar neck fractures comprise 50% of talar fractures and are classified by the Hawkins-Canale classification<sup>1-3</sup>. Operative stabilization is indicated for Hawkins-Canale types II-IV but can be complicated by the comminution and resultant medial talar neck voids. Failure to address these medial voids can lead to a dorsal and/or varus malunion or nonunion<sup>3,4</sup>.

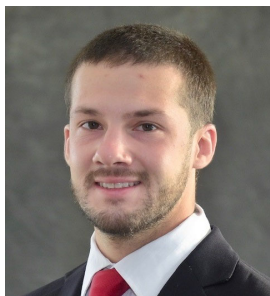
We present a novel technique using cervical spine allograft as a tricortical intercalary strut at the primary osteosynthesis of a comminuted talar neck fracture with a large medial void.

### **CASE:**

A 26-year-old female with a past medical history of ADHD, anxiety, Asperger's syndrome, and morbid obesity presented after a high-speed motor vehicle collision. On physical exam, her neurovascular status was intact, compartments were soft and compressible, and skin wrinkle sign was positive. Among multiple other injuries, CT imaging revealed a closed right Hawkins-Canale type IIA comminuted talar neck fracture with intra-articular extension into the talonavicular (TNJ) and subtalar joints (STJ) and STJ subluxation (Fig 1). Emergent operative closed reduction and temporization in an external fixator for the STJ subluxation were performed. Five days later, definitive open reduction and internal fixation (ORIF) of the talar neck fracture was performed using a dual anteromedial and anterolateral approach (Figs 2,3) as described by Buckley and Sands with minimal periosteal stripping or disruption to the talar blood supply<sup>5,6</sup>. Fracture fragments were reduced, provisionally fixated with k-wires, and a 2.7 mm locking plate was utilized for the lateral talar neck to buttress against varus collapse (Fig 2). The resultant medial talar neck void was measured, and an 8 mm x 12.5 mm x 15 mm tri-cortical lordotic cervical spacer (MTF Biologics®, Edison, NJ) was trimmed and implanted as an intercalary strut within the medial void to maintain length and prevent varus collapse (Fig 2,3). A 4.0 mm headless cannulated compression screw was placed medially from anterior to posterior instead of a plate to avoid medial impingement (Fig 2). Hawkins sign was noted at 6 weeks. Partial weight bearing was allowed at 14 weeks. Full weight bearing was allowed at 18 weeks. At final follow-up at 14 months, the patient had minimal right ankle pain, returned to work full duty without restrictions, no neurological deficits, and improved her bilateral equina vara contractures. Full osseous union noted at 8.5 months (Fig 4).

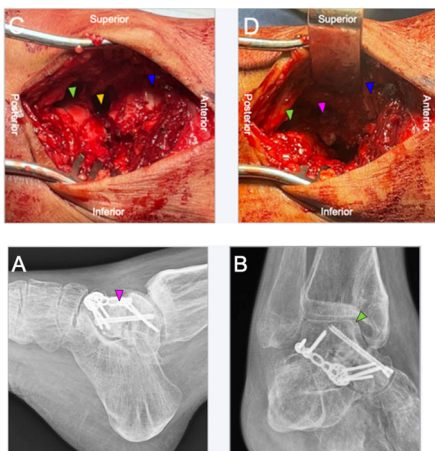


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## TALAR NECK FRACTURE WITH MEDIAL BONE VOID TREATED WITH CERVICAL SPINE ALLOGRAFT

Presenter: Daniel DeGenova, DO



### DISCUSSION:

Herein, we describe a novel technique using cervical spine allograft as a tricortical intercalary strut at primary osteosynthesis of comminuted talar neck fracture with a large medial void. This patient had osseous integration of cervical spine allograft at 8.5 months, no malunion, and minimal ankle pain at the final follow-up at 14 months. Recently, tibial cortico-cancellous autograft has been described to treat these talar neck defects with excellent union and low malunion rates<sup>4</sup>. To our knowledge, this is the first case described using cervical spine allograft to treat medial talar neck voids and should be added to the surgeon's armamentarium.

### REFERENCES:

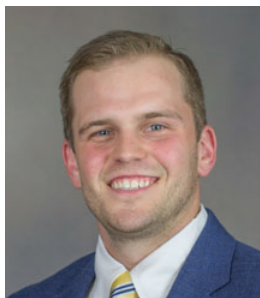
- Fortin PT, Balazsy JE. Talus fractures: evaluation and treatment. *J Am Acad Orthop Surg.* 2001;9(2):114-127
- Hawkins LG. Fractures of the neck of the talus. *J Bone Joint Surg Am.* 1970;52(5):991-1002.
- Canale ST, Kelly FBJ. Fractures of the neck of the talus. Long-term evaluation of seventy-one cases. *J Bone Joint Surg Am.* 1978;60(2):143-156.
- McMurtrie JT, Patch DA, Frazier MB, et al. Union Rates of Talar Neck Fractures With Substantial Bone Defects Treated With Autograft. *Foot & Ankle International.* 2022;43(3):343-352.
- Buckley R., Sands A. <https://surgeryreference.aofoundation.org/orthopedic-trauma/adult-trauma/talus/approach/anteromedial-approach-to-the-talus>. Accessed 21 Nov 2022.
- Buckley R., Sands A. <https://surgeryreference.aofoundation.org/orthopedic-trauma/adult-trauma/talus/approach/anterolateral-approach-to-the-talus>. Accessed 21 Nov 2022.

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### DISCLOSURES:

None



*Scott Hyland,  
DO is a resident  
in Orthopaedics at  
Doctors Hospital*

## **OUTCOMES OF MPFL RECONSTRUCTION UTILIZING ALLOGRAFT TECHNIQUE IN AN ADOLESCENT/PEDIATRIC POPULATION**

Authors: Scott Hyland, DO, Matthew Glazier, DO, A. Yassal, K. Tulchin-Francis, D. Schroeder, Matthew Beran, MD

Presenter: Scott Hyland, DO

### **INTRODUCTION:**

Patellofemoral dislocation is a common injury, with an incidence rate of 29-43 per 100,000 individuals between 10 and 17 years of age most commonly taking place during sporting events. The level of recurrent patellar instability has been reported as high as 69%, with multiple risk factors contributing to repeat injuries including female sex, trochlear dysplasia, open physes, ligamentous laxity, and prior dislocation.

Recurrent instability treated with medial patellofemoral ligament (MPFL) reconstruction have better short and long term outcomes compared to those treated non-operatively. Even in the presence of a single instability event with cartilage injury, MPFL reconstruction may be considered to further fortify stability of the knee to prevent future insult.

The use of allograft reconstruction in the pediatric and adolescent population is limited in the literature. The purpose of this study was to evaluate use of allograft MPFL reconstruction in the adolescent population which was hypothesized to be a safe and efficacious technique in restoring patellar stability in the knee.

### **METHODS:**

Following the approval of the Institutional Review Board, a retrospective chart review was performed from a single tertiary pediatric institution. Patients undergoing MPFL with allograft reconstruction between Aug 2013 and January 2021 were identified using current procedural terminology (CPT) codes and surgical records. Patients who had a previous patella stabilization procedure, those with less than 12 months of follow-up or no pre-operative MRI, and those over the age of 21 years at the time of surgery were excluded. Patients must have completed post-operative follow-up surveys to be included. Telephone follow-up was conducted for all patients meeting inclusion criteria. Once agreeing to participate, patients verbally completed the Kujala anterior knee pain scale (AKPS) and answered basic questions on episodes of recurrent instability, time to return to activities of daily living (ADLs), time to and level of return to sport, additional knee brace use, and overall satisfaction with their surgery.

Chart review included demographic information, mechanism of injury, prior and/or concomitant surgical procedures, complications and post-operative therapy and bracing. Radiographic imaging (anteroposterior, lateral and Merchant views) were used to determine physeal status (open vs closed). Pre-operative magnetic resonance imaging (MRI) was used to assess patellofemoral articulation, chondral integrity, and risk factors for patellar instability.

Descriptive statistics and frequency analysis was conducted on primary outcome measures. Binomial tests were used for sex and laterality with an expected distribution of 0.50. Non-parametric statistical analysis was performed on potential predictors, as applicable, with alpha set at 0.05.

### **RESULTS:**

109 patients underwent 120 MPFL reconstructions. Following exclusion criteria and post-operative survey responses, 25 patients (27 knees) were included in the results of this study.

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## OUTCOMES OF MPFL RECONSTRUCTION UTILIZING ALLOGRAFT TECHNIQUE IN AN ADOLESCENT/PEDIATRIC POPULATION

Presenter: Scott Hyland, DO

		AKPS	<i>p</i>
		Mean/Stddev	
<b>Total (knees)</b>		27	88.0 ± 11.4
<b>Sex</b>	Female	13 (48.1%)	83.4 ± 13.4
	Male	14 (51.9%)	92.9 ± 5.8
		<i>p</i> =1.000 †	0.017**
<b>Laterality</b>	Left	17 (63.0%)	89.5 ± 6.7
	Right	10 (37.0%)	85.3 ± 16.8
		<i>p</i> =0.248 †	0.821
<b>Physis</b>	Closed	27 (100%)	--
<b>Mechanism of Injury</b>	Trauma	5 (18.5%)	91.6 ± 3.9
	Sport (noncontact)	17 (63.0%)	87.2 ± 13.5
	Idiopathic	5 (18.5%)	87.0 ± 9.0
			0.769
<b>Recurrent Instability</b>	None	20 (74.1%)	91.3 ± 6.6
	ADL's	4 (14.8%)	73.0 ± 21.2
	Sport only	3 (11.1%)	85.7 ± 5.9
			0.071

Notes: † binomial test (2 sided, expected 0.50); ‡ Mann-Whitney U test; § Kruskal-Wallis test; \* Significant value; ADLs: activities of daily living.

<b>Follow up length average (months)</b>	54.7 ± 21.5
<b>Average age at surgery (years)</b>	14.2 ± 1.6
<b>Average time for resumption of ADLs (weeks)</b>	7.5 ± 3.4
<b>Percent of patients that returned to pre-level of sports</b>	23 (85.2%)
<b>Average time return to sports (weeks) n=25</b>	28.5 ± 14.0

### DISCUSSION:

MPFL reconstruction with allograft has shown to be an effective treatment option for patellar instability in the pediatric and adolescent population. The procedure is safe, effective, and provides stability enabling the return to preoperative sporting activity. Limitations of this study are inherent to retrospective analysis and small sample size secondary to those responding to survey. Future long-term studies will be of benefit to assess for future revisions or instability recurrence into adulthood.

### REFERENCES:

1. Redler, LH, Wright, ML. Surgical Management of Patellofemoral Instability in the Skeletally Immature Patient. JAAOS. 2018;26(19):e405-e415, 2018.
2. Khormae S, Kramer DE, Yen YM, Heyworth BE: Evaluation and management of patellar instability in pediatric and adolescent athletes. Sports Health 2015;7:115-123.
3. Lewallen L, McIntosh A, Dahm D. First-time patellofemoral dislocation: risk factors for recurrent instability. J Knee Surg. 2015;28:303-310
4. Mitchell J, Magnussen RA, Collins CL, et al. Epidemiology of patellofemoral instability injuries among high school athletes in the United States. Am J Sports Med. 2015;43:1676-1682
5. Fithian DC, Paxton EW, Stone ML, et al. History of acute patellar dislocation. Am J Sports Med. 2004;32:114-1121.

### DISCLOSURES:

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*George Durisek, MBA is a 2nd year medical student at The Ohio State University College of Medicine*

## ANALYSIS OF SHOULDER ARTHROPLASTY IN PATIENTS WITH A PRIOR SOLID ORGAN TRANSPLANT

Authors: George Durisek, MBA; Akshar Patel, BS; Erryk Katayama, BA; Gregory Cvetanovich, MD; Julie Bishop, MD; Ryan Rauck, MD

Presenter: George Durisek, MBA

### **INTRODUCTION:**

Solid organ transplant (SOT) – commonly of the kidney, liver, heart, lung, and pancreas – is an increasingly viable intervention for advanced, end-stage organ dysfunction.<sup>1</sup> The incorporation of immunosuppressive drug regimens in SOTs was a groundbreaking advancement in the 1960s which allowed evasion of acute allograft rejection mechanisms and expansion of transplantation opportunities.<sup>2</sup> Though modern immunosuppression has advanced tremendously since its conception, immunosuppression can still be accompanied by a host of adverse sequelae, including, but not limited to, infections, poor wound healing, and cardiovascular events.<sup>3,4,5</sup> For patients undergoing joint arthroplasty, a particularly important consideration is the association of extended immunosuppressant use, corticosteroids specifically, with avascular osteonecrosis.<sup>6,7</sup>

Currently, there is limited literature investigating shoulder arthroplasty outcomes in patient with prior SOT. In this series, we present the largest case series to date on this topic. The purpose of this study is to further examine the association between prior SOT and shoulder arthroplasty outcomes. We hypothesize that shoulder arthroplasty is a non-inferior treatment for SOT patients compared to their non-SOT counterparts.

### **METHODS:**

Institutional records were obtained for patients who underwent SOT prior to shoulder arthroplasty between 2010-2020 at the Ohio State University Wexner Medical Center. Patient records were reviewed to determine indication of surgery, pre- and post-operative range of motions (ROM) and strength, type and date of solid organ transplant, immunosuppressive therapy used, and any surgical complications and revisions. Wilcoxon ordered logistic regression, Rank-Sum test, and Chi-Squared test were used to analyze ordinal, continuous, and categorical variables, respectively. —

### **DATA AND RESULTS:**

39 patients (19 female, 20 male) were included and the mean follow-up was 2.5 years. There were significant improvements in range of motion and strength for the chorot as a whole: external rotation (ER) ( $34^\circ \pm 22^\circ$  to  $45^\circ \pm 16^\circ$ ;  $p=0.030$ ), forward elevation (FE) ( $90^\circ \pm 42^\circ$  to  $138^\circ \pm 26^\circ$ ;  $p<0.001$ ), internal rotation (IR) (Sacrum to L3;  $p=0.001$ ), and strength (4/5 to 4+/5;  $p=0.028$ ). There was no significant difference in pre-operative ROM and strength between AVN and non-AVN patients: ER (AVN:  $44^\circ \pm 9^\circ$ ; non-AVN:  $32^\circ \pm 23^\circ$ ;  $p=0.160$ ), FE (AVN:  $8^\circ \pm 20^\circ$ ; non-AVN:  $93^\circ \pm 45^\circ$ ;  $p=0.437$ ), IR (AVN: Ls; non-AVN: Sacrum;  $p=0.567$ ), and strength (AVN: 5/5; non-AVN 4/5;  $p=0.078$ ). Similarly, there was no significant difference in postoperative ROM for AVN vs. non-AVN patients, but strength differed: ER (AVN:  $52^\circ \pm 19^\circ$ ; non-AVN:  $45^\circ \pm 14^\circ$ ;  $p=0.339$ ), FE (AVN:  $138^\circ \pm 17^\circ$ ; non-AVN:  $140^\circ \pm 26^\circ$ ;  $p=0.551$ ), IR (AVN: L4; non-AVN: L3;  $p=0.094$ ), and strength (AVN: 4/5; non-AVN: 5/5;  $p=0.028$ ). 3/39 (8%) of patients were surgically revised and the 10-year Kaplan-Meier survival estimate was 94%.

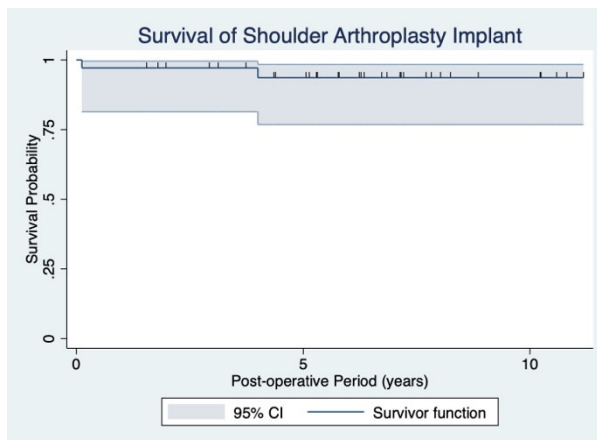
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## ANALYSIS OF SHOULDER ARTHROPLASTY IN PATIENTS WITH A PRIOR SOLID ORGAN TRANSPLANT

Presenter: George Durisek, MBA

**Figure One:** 10-Year Kaplan-Meier Survival Estimate for Shoulder Arthroplasty Post-SOT

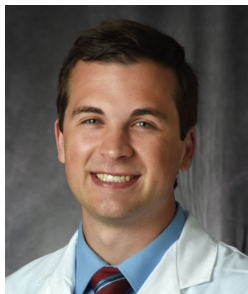


### DISCUSSION:

Individuals that undergo shoulder arthroplasty after SOT gain significantly better shoulder function post-operatively compared to pre-operatively. Individuals with pre-operative AVN produce similar results to those without AVN on external rotation, forward elevation, and internal rotation, but display a significant difference in strength. Overall, the complication rate of shoulder arthroplasty after SOT was only slightly increased from the benchmark. This leads us to believe shoulder arthroplasty after SOT is an efficacious option for patients, and surgery will improve quality of life.

### REFERENCES:

1. Black, et al. *Ann Transl Med.* 6(20). 409-421, 2018
2. Liden, et al. *Crit Care Clin.* 25(1). 165-184, 2009
3. Pilch, et al. *Pharmacotherapy.* 41(1). 119-131, 2020
4. Taylor, et al. *Crit Rev Oncol Hematol.* 56(1). 23-46, 2005
5. Ensor, et al. *Pharmacotherapy.* 31(11). 1111-1129, 2001
6. Matas, et al. *Ann Surg.* 240(3). 510-517, 2004
7. Abbott, et al. *Transplantation.* 79(3). 330-336, 2005



*Joseph Long, MD  
is a resident in  
Orthopaedics at  
Mount Carmel*

## OUTCOMES FOR AN ALTERNATIVE TECHNIQUE OF IN-SITU SCREW FIXATION IN NONDISPLACED FEMORAL NECK FRACTURES

Authors: Steven Irmeger MD, John Hwang MD

Presenter: Joseph Long, MD

### **INTRODUCTION:**

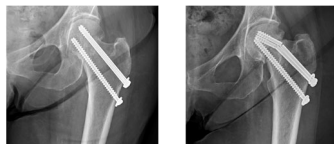
Geriatric femoral neck fractures continue to be a common cause of morbidity and mortality in the elderly. In-situ percutaneous screw fixation remains a common method of treatment for nondisplaced intracapsular injuries. Despite careful patient selection, postoperative complications are frequent causes for revision surgery. We hypothesized that an alternative construct with a fully threaded inferior screw would reduce the rate of revision and postoperative varus collapse.

### **METHODS:**

A retrospective analysis was performed on consecutive nondisplaced femoral neck fractures treated with percutaneous screw fixation between 2015-2021. Only constructs using cannulated screws in an inverted triangle configuration were considered. Patients were subdivided into a fully threaded group (FT) utilizing a fully threaded inferior calcar positioning screw (n=24), or a partially threaded group (PT) utilizing only partially threaded screws. We employed a randomized 2 to 1 age and gender matching strategy for our FT group, drawing from our identified PT cohort.

### **DATA AND RESULTS:**

There were 16 (67%) females in the FT group with a mean (standard deviation) age of 80.4 (10.8). In the FT group, we identified only 1 case of required revision surgery (4.2%), vs 11/48 (25%) in our control PT group (p=0.03) during the study period and subsequent follow up. Revision surgery was most commonly due to significant femoral neck shortening and varus collapse. No instance of varus collapse was identified in our FT group. The most common revision surgery in both groups was arthroplasty (n=11) and revision to a fixed angle device (N=1).



2 week and 10 month post op images demonstrating nonunion and failure of the two superior screws in our one FT revision case. Patient underwent successful conversion to THA

### **DISCUSSION:**

To our knowledge, this is the first study to propose and evaluate revision rates for in-situ pinning using a fully threaded inferior positioning screw. We found a significantly lower rate of revision surgery in our FT group, without varus collapse. Further prospective studies are warranted to evaluate for widespread adoption of our technique.

### **REFERENCES:**

1. Kain MS, et al. *Clin Orthop Relat Res.* 472(12): 4010-4, 2014
2. Shin KH, et al. *Injury.* 51(4):1031-37, 2020
3. Cuellar DO, et al. *Injury.* 53(8):2839-2845, 2022

### **ACKNOWLEDGEMENTS:**

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*David Pettit, MD  
is a resident in  
Orthopaedics at  
The Ohio State  
University*

## ORTHOPAEDISTS’ PATH TO THE NFL SIDELINE: A REVIEW OF PROFESSIONAL TEAM PHYSICIAN TRAINING

Authors: David Pettit MD, Timothy Miller MD

Presenter: David Pettit MD

### **INTRODUCTION:**

The National Football League consists of 32 teams. Each team has a dedicated medical staff consisting of a head physician, associate physicians, physical therapists, athletic trainers as well as providers and consultants from other medical specialties. Little has been published about the education and training backgrounds of the head team physicians in the NFL.

Very often, trainees in orthopaedics and sports medicine have the goal of becoming a team physician at the highest level. The goal of this study was to determine if there were any common variables in training and academic productivity among the 32 NFL team head physicians.

### **METHODS:**

The NFL Physicians’ Society registry was used to identify the head team physicians. Their CVs were then reviewed from public sources to identify where they completed medical school, residency and fellowship. Their CVs and press releases were used to identify when they were named head team physician as well as how long the physician had been in practice prior to obtaining the head physician role. Finally, their CVs and PubMed were queried to determine their number of peer reviewed publications.

### **RESULTS:**

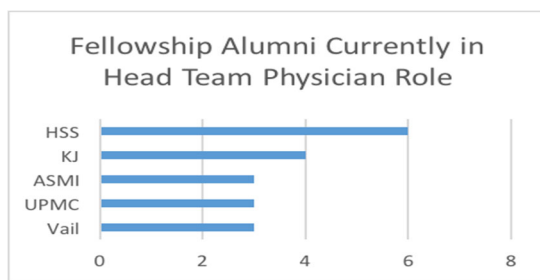
All but four head team physicians were orthopaedic surgeons. The other specialties included were internal and family medicine.

As expected, there were no common trends in medical school. In regards to residency training, Hospital for Special Surgery (HSS) was the most common program with five physicians completing their residency there.

The most common fellowship training sites were HSS (6), Kerlan-Jobe Orthopaedic Clinic (KJ) (4), American Sports Medicine Institute (3), University of Pittsburgh (3) and The Steadman Clinic (3).

The average time in practice before obtaining the head team physician job was 12.1 years.

The number of publications per physician ranged from 1 to 344. The average number was 65.12, and the median was 24.



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## ORTHOPAEDISTS' PATH TO THE NFL SIDELINE: A REVIEW OF PROFESSIONAL TEAM PHYSICIAN TRAINING

Presenter: David Pettit MD

### DISCUSSION:

The path to becoming a head team physician is highly variable, however, there are some trends that can be identified. Excellent residency training is crucial to success in orthopaedic surgery. Only one program appeared consistently in our data. However, 19 of the 32 head team physicians trained at only five different fellowship programs. These five fellowship programs have long been regarded as "top tier." Although not evaluated, this likely relates to the exposure to high level athletics, mentorship and the strong alumni network that these programs provide. Our data also showed physicians are often in practice over a decade prior to obtaining the head physician role. Most physicians spent time as an associate prior to obtaining the head role. Finally, academic productivity was extremely variable, but contributing to the advancement of the field of sports medicine does appear to play a role.

When counseling young trainees who have aspirations of providing sports medicine care at the highest level, emphasis should be placed on completing fellowship at a "top tier" program. Academic productivity can also help build their CV. However, most importantly, they should find a mentor who can help them achieve their career goals as well as assist in networking opportunities.

### REFERENCES:

1. *Tayne, et al. Current Sports Medicine Reports. 1903: 119-123, 2020*
2. *Miller, et al. Current Sports Medicine Reports. 2010:553-561, 2021*
3. *Young, et al. The Orthopaedic Journal of Sports Medicine. 10(11):1-5*

### DISCLOSURES:

The authors of this study have no disclosures that are relevant to the work of this study.



*Tucker Peabody, DO is a resident in Orthopaedics at Doctors Hospital*

## ASSOCIATION BETWEEN PRONATION EXTERNAL ROTATION IV FRACTURE PATTERN AND REGIONAL BONE DENSITY

Authors: D. Casciato, Daniel DeGenova, DO, Z. Hill, Tucker Peabody, DO, NP Schmidt, Brian Taylor, DO

Presenter: Tucker Peabody, DO

### INTRODUCTION:

-Regional bone density accounts for difference in lower extremity fracture patterns and healing. Adding to previous research examining supination external rotation IV injuries, this investigation examines regional bone density differences between pronation and external rotation (PER) IV equivalent and fracture patterns using CT- derived Hounsfield units (HU).

### METHODS:

-Retrospective chart review was conducted among patients without a history of fracture or diagnosed osteoporosis who sustained a PER IV ankle fracture. Demographic data was collected. Fractures were separated between PER IV equivalent and actual fracture groups. CT-derived HU was assessed at the distal tibia and fibula. Density was compared between PER IV equivalent and fracture groups and amount posterior malleolar fracture patterns.

-Student t-test and Fisher's exact test used to identify statistically significant differences among means and proportions. ANOVA used to compare the average tibial HU values among the posterior malleolus fracture pattern and PER-equivalent groups. Tukey test was run post-hoc to identify statistical significance among groups if ANOVA was significant

### RESULTS:

-75 patients met selection criteria with 17 comprising the equivalent fracture group and 58 in the fracture group. There were 38 type 1, 9 type 2, and 11 type posterior malleolus fractures. The ankle bone density of the PER fracture equivalent group ( $331.98 \pm 6571$  HU) was greater than that of the PER fracture group ( $281.61 \pm 76.99$  HU;  $p = 0.008$ ). There existed a statistically significant difference in tibial bone densities among equivalent and all PER fracture types ( $p = 0.01$ ) with equivalent group ( $331.98 \pm 6571$  HU) maintaining a greater tibial bone density than the type 2 posterior malleolar fracture group ( $252.35 \pm 57.33$  HU;  $p = 0.009$ ).

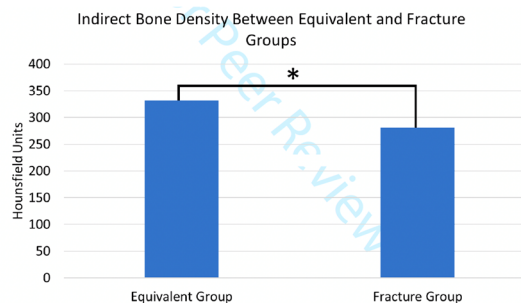


Figure 3: Average ankle bone density between PER IV Equivalent and Fracture groups. \* $p = 0.008$ .

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## ASSOCIATION BETWEEN PRONATION EXTERNAL ROTATION IV FRACTURE PATTERN AND REGIONAL BONE DENSITY

Presenter: Tucker Peabody, DO

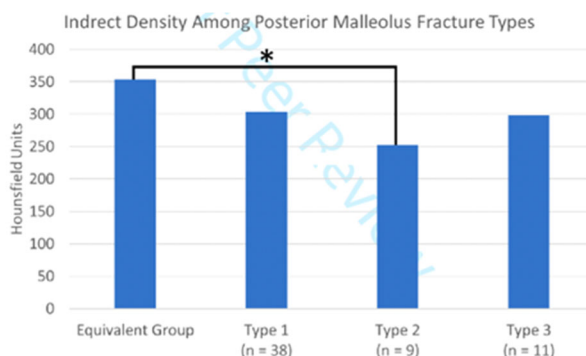


Figure 4: Average tibial bone density among PER IV Equivalent and Fracture group posterior malleolus fracture patterns. \*p = 0.009

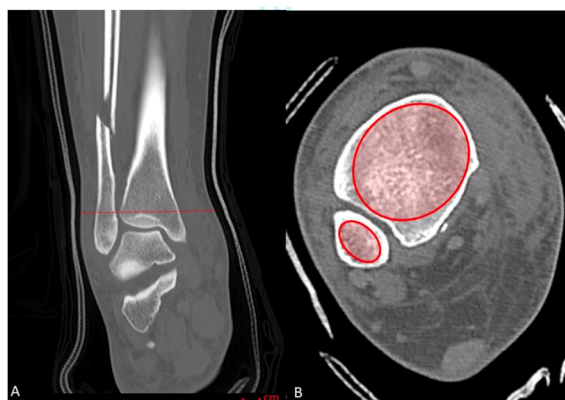


Figure 2: (A) Selection of plane for analysis 1cm proximal to tibiotalar joint. (B). Selected region of interest for distal tibia and fibula

### DISCUSSION:

Higher bone density was associated with PER IV equivalent fractures, however, there was no density difference among posterior malleolus fracture types. When presented with PER IV fractures, surgeons may consider fixation that addresses a lower bone density

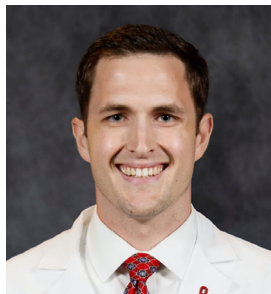
### REFERENCES:

Haraguchi N. Pathoanatomy of posterior malleolar fractures of the ankle. *JBJS* 2006 May (5) 1085-92

Blom RP, et al. Posterior malleolar ankle fracture morphology determines outcome in rotation type ankle fractures. *Injury* 2019 Jul (7) 1392-1397

Levack AE. Comparing Functional Outcomes After Injury-Specific Fixation of Posterior Malleolar Ankle Fractures and Equivalent Ligamentous Injuries in Rotational Ankle Fractures. *JOT* 2018 123-128

ACKNOWLEDGEMENTS/DISCLOSURES: None



*Seth Wilson, BS  
is a 2nd year  
medical student at  
The Ohio State  
University College  
of Medicine*

## HOW WERE ANATOMIC SHOULDER ARTHROPLASTY OUTCOMES AFFECTED BY THE COVID-19 PANDEMIC?

Authors: Seth Wilson, BS, Andrew Stevens, BS<sup>a</sup>, Akshar Patel, BS, Elizabeth Caraballo, BS, Gregory Cvetanovich, MD, Julie Bishop, MD,, Ryan Rauck, MD  
Presenter: Seth Wilson, BS

### **Introduction:**

The COVID-19 pandemic shutdowns interrupted the normal standard of care for patients receiving ATSA. Recent literature has illustrated that there was an associated decrease in surgical volume and hospital length of stay, with an increase in discharge-home rates and the use of telemedicine for follow-ups<sup>1,2,3</sup>. The purpose was to investigate the difference in anatomic total shoulder arthroplasty (ATSA) outcomes between patients affected by the COVID-19 pandemic shutdown and a control group. We hypothesized that patients in 2020 would have decreased access to physical therapy (PT) and worse postoperative outcomes.

### **Methods:**

Patients who received ATSA between 1/1/2020 to 3/17/2020 were selected to be included and patients who underwent ATSA between 1/1/2019 to 3/17/2019 were used as a control group. Retrospective chart review was performed, and patient reported outcomes were recorded at an average of  $2.68 \pm 0.06$  years and a minimum of 1 year postoperatively. Patient data was collected and analyzed statistically using the 2-sample t-test and Chi-square test. The Mann Whitney U test and Fisher's Exact test were used when appropriate.

### **Results:**

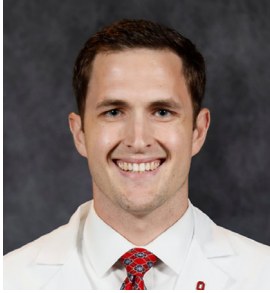
27 patients in 2020 were included in this study and compared to 24 patients in 2019. ATSA performed in 2020 had improvements in forward elevation (FE) ( $120.2^\circ \pm 28.8^\circ$  to  $141.1^\circ \pm 25.9^\circ$ ,  $p=0.009$ ), external rotation (ER) ( $32.9^\circ \pm 16.5^\circ$  to  $42.0^\circ \pm 13.7^\circ$ ,  $p=0.037$ ), and internal rotation (IR) (S1 to L3,  $p=0.002$ ). Patients in 2020 did not have significant improvements in strength (FE: 5- to 5-,  $p=0.38$ ; ER: 5- to 5-,  $p=0.29$ ; IR: 5 to 5,  $p=0.76$ ). There was no significant difference in outcomes between the 2019 and 2020 cohort (Table I). Patients in 2020 terminated PT earlier (2019:  $125.8 \pm 70.7$  days, 2020:  $91.1 \pm 47.0$  days,  $p=0.046$ ) and completed fewer sessions (2019:  $21.4 \pm 10.8$  sessions, 2020:  $13.1 \pm 8.4$  sessions,  $p=0.003$ ) than patients in 2019. Of the 2020 cohort, 7.4% did not initiate PT, 7.4% reported a delay in initiating PT, and 37% reported that the COVID-19 pandemic negatively affected their recovery. In October 2022, patients in the 2020 group reported an average SANE score of  $77.0 \pm 15.8$  on their affected shoulder and a VAS pain score of  $1.67 \pm 1.1$ .

**Discussion:** Despite terminating PT earlier and completing less PT overall, patients who underwent ATSA in 2020 had significant improvements in pain and ROM when assessed at final follow-up and were comparable to patients in 2019. 37% of patients in the 2020 cohort reported that they felt their post operative rehab course was negatively affected by COVID-19 despite no significant difference in outcomes between cohorts.

### **References:**

1. Parisien RL, Shin M, Constant M, et al. Telehealth utilization in response to the novel coronavirus (COVID-19) pandemic in orthopaedic surgery. *J Am Acad Orthop Surg* 2020; 28: e487–e492.
2. Seetharam A, Ghosh P, Prado R, Badman BL. Trends in outpatient shoulder arthroplasty during the COVID-19 (coronavirus disease 2019) era: increased proportion of outpatient cases with decrease in 90-day readmissions. *J Shoulder Elbow Surg*. 2022;31(7):1409-1415. doi:10.1016/j.jse.2021.12.031
3. Cole EW, Moulton SG, Werner BC, Denard PJ. Why patients fail to achieve a Patient Acceptable Symptom State (PASS) after total shoulder arthroplasty? *JSES Int*. 2021 Nov 17;6(1):49-55. doi: 10.1016/j.jseint.2021.09.017. PMID: 35141676; PMCID: PMC8811410.

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## HOW WERE ANATOMIC SHOULDER ARTHROPLASTY OUTCOMES AFFECTED BY THE COVID-19 PANDEMIC?

Presenter: Seth Wilson, BS

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### **Acknowledgements:**

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### **Disclosures:**

This research was not funded by specific grants from funding agencies in the public, commercial, or non-for-profit sectors. The authors declare that there is not financial conflict of interest.



*Thomas J. Utset-Ward is a Fellow in Musculoskeletal Oncology at The Ohio State University*

## BREAKING CONVENTION: NO DIFFERENCE IN LOCAL RECURRENCE RESECTING BIOPSY TRACT AND PRIMARY SARCOMA SEPARATELY

Authors: Thomas J. Utset-Ward, MD, Dashaun Ragland, Leah Utset, Thomas Scharschmidt, MD

Presenter: Thomas J. Utset-Ward, MD

### INTRODUCTION:

Including the biopsy tract with primary resections may limit operative options, potentially contributing to higher morbidity. This study aims to explore whether resecting biopsy tracts separately from the primary wide tumor resection specimen has any effect on local recurrence and overall survival.

### METHODS:

This is a retrospective single-center study from 2014 to 2023. A total of 45 pediatric sarcoma cases were included with diagnoses of osteosarcoma (n=30), Ewing sarcoma (n=11), other primary bone sarcoma (n=4). Of these, the biopsy tract was resected separately from the main specimen in 24 (53%) cases.

### RESULTS:

We noted a total local recurrence of 6.7% pediatric bone sarcomas. For cases with separate biopsy resection, 4.3% (n=1) demonstrated evidence of disease in the separate biopsy tract specimen. Separate resection of the biopsy tract did not affect the rate of local recurrence (OR 0.88, 95% CI 0.11, 6.77, p=0.90). There was no association between local recurrence and open vs core-needle biopsy (OR 0.28, 95% CI 0.35, 2.29, p=0.24). Positive margins in the primary resected specimen (18% of cases) was an independent risk factor for the development of local recurrence.

### DISCUSSION:

There was no increased risk of local recurrence in cases where the biopsy tract was resected separately compared to cases where it was resected with the main tumor. Positive margins in the primary resection specimen was the greatest predictor of local recurrence, so optimizing surgical approach and resection strategy to best ensure negative margins is paramount.

ACKNOWLEDGEMENTS: None

DISCLOSURES: None

Population	Total (n=45)	Separate Biopsy Tract (n=24)	No Separate Biopsy Tract (n=21)
Male (%)	28 (62.2%)	15 (62.5)	14 (66.7)
<b>Tumor Stage</b>			
T1 (grade 2)	1 (2.2%)	0	1 (4.8%)
T2	39 (86.7%)	21 (87.5%)	19 (90.5%)
T3 (mets a diagnosis)	5 (11.1%)	3 (12.5%)	2 (9.5%)
<b>Tumor Grade</b>			
Grade 2	1 (2.2%)	0	1 (4.8%)
Grade 3	35 (77.8%)	22 (91.7%)	13 (61.9%)
<b>Tumor Location</b>			
Femur	18 (40.0%)	13 (54.2%)	5 (23.8%)
Tibia/Fibula	14 (31.1%)	6 (25%)	8 (38.1%)
Pelvis/Sacrum	3 (6.7%)	0	3 (14.3%)
Humerus	8 (17.8%)	5 (20.8%)	3 (14.3%)
Scapula	1 (2.2%)	0	1 (4.8%)
Thigh	1 (2.2%)	0	1 (4.8%)
<b>Histology</b>			
Osteosarcoma	30 (66.7%)	19 (79.2%)	11 (52.4%)
Ewing	11 (24.4%)	3 (12.5%)	8 (38.1%)
Rhabdomyosarcoma	1 (2.2%)	0	1 (4.8%)
Chondrosarcoma	1 (2.2%)	0	1 (4.8%)
Adamantinoma	1 (2.2%)	1 (4.2%)	0
Other/NOS Sarcoma	1 (2.2%)	1 (4.2%)	0

Table 1

Biopsy Information	Total (n=45)	Separate Biopsy Tract (n=24)	No Separate Biopsy Tract (n=21)
<b>TYPE</b>			
Open Biopsy	34 (75.6%)	21 (87.5%)	13 (61.9%)
Core Needle	11 (24.4%)	3 (12.5%)	8 (38.1%)
<b>SPECIALTY PERFORMING BIOPSY</b>			
Ortho	38 (84.4%)	23 (95.8%)	15 (71.4%)
Radiology	6 (13.3%)	1 (4.2%)	5 (23.8%)
Other	1 (2.2%)	0	1 (4.8%)
<b>POSITIVE MARGINS</b>	8 (17.8%)	3 (12.5%)	5 (23.8%)
<b>LOCAL RECURRENCE</b>	4 (8.9%)	2 (8.3%)	2 (9.5%)

Table 2





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***The Department of Orthopaedics would like to thank all of the presenters  
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*We would also like to thank the following for making this research day a success:*

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*Visiting Professor and Moderator*

*For lending her time and expertise to our research day*

***Steven Lavender, Ph.D. & Nathaniel Bates, Ph.D.***

*Directors of Mallory-Coleman Research Day*

*For coordinating the scientific presentations*

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