

Medial Elbow Exposure: Modified Taylor-Scham Versus FCU-Split

Short Title: **Modified Taylor-Scham Versus FCU-Split**

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Disclaimers

The views expressed in this article are those of the authors and do not necessarily reflect the official policy or position of the Department of Defense or the US Government.

This study was performed in accordance with the ethical standards in the 1964 Declaration of Helsinki and was carried out in accordance with relevant regulations of the US Health Insurance Portability and Accountability Act (HIPAA).

Keywords: Cadaver dissection, elbow surgery, flexor carpi ulnaris, surgical approach, anatomy, orthopaedic surgery

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117 **ABSTRACT**

118 **Background**

119 Internal fixation of anteromedial coronoid process fractures can be performed using a medial
120 skin incision through various inter and intra-muscular intervals. The purpose of this study was to
121 compare the exposure of the coronoid process, anteromedial facet, and anterior band of the
122 medial collateral ligament using the flexor carpi ulnaris (FCU)-Splitting approach and Taylor-
123 Scham approach modified with an ulnar nerve transposition.

124 **Methods**

125 Thirty approaches were performed on fifteen fresh cadavers using a randomized cross-over
126 design and standardized incision. Access to key anatomic landmarks was assessed and a
127 calibrated digital image was taken from the surgeon's best perspective of each approach. Images
128 were analyzed using ImageJ (NIH) software to calculate the area of osseous exposure.

129 **Results**

130 All key anatomic landmarks were visualized using both approaches. The average area of
131 exposure for the Taylor-Scham was 19.5 cm² compared to 13.6 cm² for the FCU-Splitting ($p <$
132 0.0001). The distal extent of the FCU-Splitting approach is limited by the ulnar nerve and its
133 branches to the humeral head of the FCU.

134 **Conclusion**

135 The Taylor-Scham approach provides a more extensile exposure of the anteromedial coronoid
136 and proximal ulna than the FCU-Splitting approach while avoiding cross-tensioning of the ulnar
137 nerve.

138 **Level of Evidence:** Level V; Anatomic Study; Cadaver Dissection

139 **Keywords:** Cadaver dissection, elbow surgery, flexor carpi ulnaris, surgical approach, anatomy,
140 orthopaedic surgery

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142 **INTRODUCTION**

143 The coronoid process plays an important role in elbow stability. The anteromedial facet of the
144 coronoid process serves as a key anterior bony buttress, capsular attachment, and insertion for
145 the anterior bundle of the medial collateral ligament (MCL) at the sublime tubercle.¹ Fractures of
146 the anteromedial facet can extend past the sublime tubercle, destabilizing the attachment of the
147 anterior band of the MCL. A subset of elbow instability results from fractures of the
148 anteromedial facet, leading to posteromedial rotatory subluxation or dislocation.^{4,11} This is in
149 contrast to the more common posterolateral rotatory mechanism. To restore anterior stability of
150 the ulnohumeral joint, fractures of the coronoid that involve the anteromedial facet warrant
151 fixation. Exposure for internal fixation of these injuries varies between surgical approaches to the
152 medial elbow.

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154 Anteromedial facet fractures are typically fixed using a buttress plate or screw to help restore
155 elbow stability.^{3,4,11} Internal fixation of the anteromedial coronoid process is typically performed
156 through a medial skin incision using one of three intervals, all based on the flexor carpi ulnaris
157 (FCU). The most anterior, described by Hotchkiss⁵, utilizes the interval anterior to the FCU and
158 posterior to the palmaris longus (PL). The Hotchkiss “Over-the-Top” is traditionally used for
159 fractures that remain anterior to the sublime tubercle (Figure 1 #1).^{7,10,17} The second exploits the
160 interval between the ulnar and humeral heads of the FCU, which is easily identified by following
161 the ulnar nerve as it enters the forearm between the two heads of FCU (Figure 1 #2).^{7,10,11,15} The

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162 third, a posteromedial approach described by Taylor and Scham²¹, utilizes the interval posterior
163 to the FCU and requires elevation of the flexor-pronator mass from the medial ulna (Figure 1
164 #3).

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166 The FCU-Split has previously been shown to provide more extensive exposure to the
167 anteromedial coronoid, proximal ulna, and medial ligamentous structures when compared to the
168 Hotchkiss Over-the-Top.⁷ However, there has not yet been a similar quantitative comparison
169 between the FCU-Split and Taylor-Scham approaches, which can each be utilized for the
170 treatment of injuries to the anteromedial facet and anterior bundle of the MCL. The purpose of
171 this study was to compare the exposure of the proximal anteromedial ulna and key anatomic
172 landmarks using the FCU-Splitting approach and Taylor-Scham approach with an ulnar nerve
173 transposition.

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185 **MATERIALS and METHODS**

186 **Study Design**

187 Thirty surgical approaches were performed on fifteen fresh (non-frozen, non-fixed) cadaveric
188 specimens using a randomized cross-over design to determine which approach was performed
189 first. Both approaches were performed on each cadaver, one for each elbow, to allow more
190 accurate comparisons between the Taylor-Scham and FCU-Split. Each incision was standardized
191 to 20 cm in length and based along the posterior aspect of the medial epicondyle, extending 6 cm
192 proximally and 14 cm distally over the FCU. Each dissection was carried in a manner that would
193 simulate fixation of the coronoid process. One specimen (Table 3, #8) had evidence of a
194 superficial traumatic laceration about the medial elbow that did not involve the location of our
195 incision. A second specimen (Table 3, #9) had a previous medial elbow incision with an ulnar
196 nerve transposition without evidence of further dissection beyond the cubital tunnel. The
197 remaining specimens had no evidence of previous surgery or trauma to the elbow.

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199 **Taylor-Scham Approach**

200 Using the standardized 20 cm incision, full-thickness flaps were created. The ulnar nerve was
201 identified either proximal to the medial epicondyle or as it passed between the two heads of the
202 FCU. The superficial and deep fascia of the FCU were sharply released, and the ulnar nerve was
203 transposed anteriorly to the medial epicondyle, which is a modification from the original
204 description²¹. Articular branches of the ulnar nerve were sacrificed as needed. The first motor
205 branch to the FCU was not visualized or sacrificed. The fascia overlying the ulnar head of the
206 FCU was identified and incised along the ulnar border along the length of the incision to the
207 medial epicondyle. A cuff of fascia from the ulna was left in place to simulate a later repair. The

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208 ulnar head of the FCU was then elevated along with the flexor-pronator mass to expose the
209 proximal anteromedial ulna, MCL, and coronoid. The humeral attachments of the flexor-pronator
210 mass were preserved. Retractors were placed anteriorly as needed to optimize visualization. The
211 brachialis tendon was identified as the radial extent of the dissection. A capsulectomy was
212 performed to define the osseous structures and anterior band of the MCL for quantitative
213 analysis.

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215 **FCU-Splitting Approach**

216 The FCU-splitting approach was performed similarly to that previously described by Huh et al.⁷
217 to allow for the comparison of quantitative measurements. Using the standardized 20 cm incision
218 full-thickness flaps were created. The ulnar nerve was identified either proximal to the medial
219 epicondyle or as it passed between the two heads of the FCU. The interval between the ulnar and
220 humeral heads of the FCU was developed and any branches from the ulnar nerve were identified.
221 Articular branches were sacrificed. The first motor branch to the FCU was identified. The flexor-
222 pronator mass was elevated from the coronoid and, with the humeral head of the FCU, was
223 retracted anteriorly, while the ulnar head of the FCU was left with its origin. The brachialis
224 tendon was identified as the radial extent of the dissection. The ulnar head of the FCU was
225 elevated from the proximal ulna and retracted posteriorly. A capsulectomy was performed to
226 define the osseous structures and anterior band of the MCL for quantitative analysis.

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228 **Data Collection**

229 After each approach visualization of the coronoid process, anteromedial facet, sublime tubercle,
230 anterior band of the MCL, and brachialis tendon insertion were assessed. Retractors were

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231 position to provide optimal visualization and a digital photograph was taken from a volar
232 anteromedial perspective to allow maximum visualization of the proximal ulna and coronoid
233 process. A 1 cm ruler was placed perpendicular to the line-of-site for calibration to perform
234 quantitative analysis. Images were then analyzed using a computer program, ImageJ (National
235 Institutes of Health, Bethesda, MD)¹³, to calculate the area of osseous exposure. The proximal
236 aspect of the sublime tubercle was used as the most proximal extent of measurement. Statistical
237 analysis was performed using the Wilcoxon signed-rank test for comparing the FCU-Splitting
238 approach to the Taylor-Scham approach. The Wilcoxon rank-sum test was used to compare our
239 FCU-Splitting approach to the surface area measurements of the same approach reported by Huh
240 et al.⁷ Significance was set at $P < 0.05$.

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254 **RESULTS**

255 The two approaches were performed as described in all cadaveric specimens (Table 1). All key
256 anatomic landmarks were visualized for both approaches. There was no statistically significant
257 difference between laterality and sequence of dissection of the Taylor-Scham ($P = 0.158$) or
258 FCU-Splitting ($P = 0.523$) approaches. The average area of exposure for the Taylor-Scham
259 approach was 19.5 cm^2 (range 14.1 - 23.5; SD 2.6 cm) compared to 13.6 cm^2 (range 7.4 - 20.1;
260 SD 3.1) for the FCU-Splitting approach ($P < 0.0001$) (Figure 2, Table 2). There was no
261 significant difference after comparing the results of the FCU-Splitting approach performed in
262 this study to the data reported by Huh et al.⁷, who reported an average exposure of 13.3 cm^2 ($P =$
263 0.726).

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277 **DISCUSSION**

278 Surgical stabilization of the anteromedial facet of the coronoid process restores the anteromedial
279 buttress of the coronoid to prevent traumatic posteromedial rotatory instability.^{2,11,18} Key
280 anatomic structures of the medial elbow and proximal ulna can be accessed through medial
281 approaches centered on and around the FCU. The FCU-Splitting approach has previously been
282 shown to provide greater osseous exposure and more consistent exposure to key anatomic
283 landmarks compared to the Hotchkiss “Over-the-Top” approach.⁷ Based on the cadaveric
284 specimens we examined, the modified Taylor-Scham approach (Figure 4) provides increased
285 exposure of key osseous and ligamentous structures of the proximal ulna when compared to the
286 FCU-Splitting approach. Additional advantages include extensive exposure of the olecranon
287 process, exploitation of an inter-nervous plane, extensile both proximally and distally, and the
288 avoidance of direct retraction or cross-tensioning of the ulnar nerve against its branches (Table
289 3).

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291 Injury to the ulnar nerve is a known risk of medial elbow exposures.^{4,16} Although a commonly
292 used approach, the FCU-Split requires retraction of the ulnar nerve and is limited distally by its
293 intramuscular plane - resulting in retraction, tensioning or sacrifice of motor branches to the FCU
294 (Figure 3). The innervation of the FCU arises from the ulnar nerve as two primary branches
295 which enter the muscle belly at its proximal end in conjunction with vascular structures.⁹ In a
296 cadaveric study assessing a muscle-splitting approach for MCL repair, Smith et al.²⁰ found that
297 the first motor branch to the FCU arose 3.2 cm distal to the medial epicondyle (range 1.5-6.5
298 cm). This distance is supported by Jost et al.⁸ who identified the first motor branch at a mean of
299 2.9 cm (range 1.9-5.2 cm) from the medial epicondyle. Even when identified and protected, these

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300 structures require direct manipulation and risk injury when using the intramuscular interval of
301 the FCU-Split.

302

303 Despite originally being described for fixation of olecranon process fractures, the Taylor-Scham
304 approach has been recommended in cases that require exposure of large coronoid process
305 fragments.^{4,12,14,15,21} In contrast to the FCU-Splitting approach, the Taylor-Scham approach is
306 extensile both proximally along the medial supracondylar ridge and distally along the ulna.^{12,21}

307 The length of the ulna can be exposed using the internervous plane between the FCU and
308 extensor carpi ulnaris (ECU). The extensive exposure provided by elevation of the flexor-
309 pronator mass from the ulna suggests that care must be taken to avoid excessive soft tissue and
310 periosteal stripping. A variation of the Taylor-Scham has been described that limits soft-tissue
311 dissection and, like the originally described approach, avoids ulnar nerve transposition while still
312 providing the extensile interval needed.¹⁹

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314 Other notable cadaveric studies have been used to better characterize exposure and limitations
315 for approaches to the medial elbow.^{6,8} Jost et al.⁸ describe an extended medial elbow approach
316 (EMEA), which utilizes the same internervous plane as the Hotchkiss Over-the-Top and
317 provided greater exposure to the proximal ulna than the FCU-Split. They emphasize the limited
318 extent of the FCU-Split and risk to the first motor branch from the ulna nerve. One disadvantage
319 to the EMEA is the difficulty with careful identification of the correct internervous plane and
320 protection of the median nerve. The authors also suggest that the EMEA is limited distally by the
321 posterior recurrent ulnar artery, although sacrificing this artery can often be performed without
322 significant clinical implications.^{8,21} Huang et al.⁶ compared 5 approaches to the medial elbow

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323 using 3D imaging to determine the visible surface area of the coronoid process, distal humerus,
324 and radial head. The described dissections included measuring the surface area of the radial head
325 and distal humerus by elevation or release of the flexor-pronator mass. The difference in surface
326 area of the Taylor-Scham was larger than the FCU-Split, however, this difference was not
327 statistically significant ($P = 0.27$).

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329 The modified Taylor-Scham approach described in this study should not be considered superior
330 to other approaches to the medial elbow. However, this approach can be effective when
331 managing trauma to the anteromedial facet or the anterior bundle of the MCL that occur
332 concomitantly with other injuries, such as large coronoid fragments that extend beyond the
333 sublime tubercle and fractures involving ulnar shaft, olecranon process, or distal humerus. The
334 Taylor-Scham is easily extended into a standard posterior approach to the elbow when needed.
335 Furthermore, avoiding direct retraction and constant management of the ulnar nerve is a
336 significant advantage over the FCU-Split.

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338 There are several limitations to our study. First, this was a cadaveric study that relied on the
339 limbs of patients with a mean age of 76.7 years of age. Increased osseous exposure could have
340 been the result of decreased muscle mass and lack of muscle tone. Additionally, a power analysis
341 was not performed as we were limited by the total number of specimens available. Most
342 importantly, quantitative measurements were based on a two-dimensional image to approximate
343 a three-dimensional structure. Although we made retractor and camera adjustments to allow for
344 maximum visualization of exposed bone, the area measured is not an exact measurement of
345 osseous surface area. However, the two-dimensional measurements of each dissection were

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346 compared to a two-dimensional measurement from the same specimen's contralateral limb thus
347 providing a platform for direct comparison.

348

349 **CONCLUSION**

350 The Taylor-Scham approach with an ulnar nerve transposition provides a more extensile osseous
351 exposure of the anteromedial coronoid and proximal ulna when compared to the FCU-Split. In
352 addition, it minimizes risks to the ulnar nerve that are inherent to the FCU-Split such as direct
353 retraction and potential injury or sacrifice of its motor branches. This approach can be considered
354 for injuries that require increased exposure than typically provided by the FCU-Split.

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369 **REFERENCES**

- 370 1. Closkey RF, Goode JR, Kirschenbaum D, Cody RP. The role of the coronoid process in
 371 elbow stability. A biomechanical analysis of axial loading. *J Bone Joint Surg Am.*
 372 2000;82(12):1749-1753. doi:10.2106/00004623-200012000-00009
- 373 2. Doornberg JN, de Jong IM, Lindenhovius ALC, Ring D. The anteromedial facet of the
 374 coronoid process of the ulna. *J Shoulder Elbow Surg.* 2007;16(5):667-670.
 375 doi:10.1016/j.jse.2007.03.013
- 376 3. Doornberg JN, Ring D. Coronoid fracture patterns. *J Hand Surg.* 2006;31(1):45-52.
 377 doi:10.1016/j.jhsa.2005.08.014
- 378 4. Doornberg JN, Ring DC. Fracture of the anteromedial facet of the coronoid process. *J Bone*
 379 *Joint Surg Am.* 2006;88(10):2216-2224. doi:10.2106/JBJS.E.01127
- 380 5. Hotchkiss RN, Kasparyan GN. The medial “Over the top” approach to the elbow. *Tech*
 381 *Orthop.* 2000;(15):105-112.
- 382 6. Huang AL, Hackl M, Chan AHW, Axford DT, Athwal GS, King GJW. Medial elbow
 383 exposure: an anatomic comparison of 5 approaches. *J Shoulder Elbow Surg.*
 384 2021;30(3):512-519. doi:10.1016/j.jse.2020.06.031
- 385 7. Huh J, Krueger CA, Medvecky MJ, Hsu JR, Skeletal Trauma Research Consortium. Medial
 386 elbow exposure for coronoid fractures: FCU-split versus over-the-top. *J Orthop Trauma.*
 387 2013;27(12):730-734. doi:10.1097/BOT.0b013e31828ba91c
- 388 8. Jost B, Benninger E, Erhardt JB, Külling FA, Zdravkovic V, Spross C. The extended medial
 389 elbow approach-a cadaveric study. *J Shoulder Elbow Surg.* 2015;24(7):1074-1080.
 390 doi:10.1016/j.jse.2015.03.013
- 391 9. Lim AY, Kumar VP, Hua J, Pereira BP, Pho RW. The neuromuscular compartments of the
 392 flexor carpi ulnaris. *Plast Reconstr Surg.* 1999;103(3):1046-1051; quiz 1052, discussion
 393 1053.
- 394 10. Mehta JA, Bain GI. Surgical approaches to the elbow. *Hand Clin.* 2004;20(4):375-387.
 395 doi:10.1016/j.hcl.2004.06.002
- 396 11. O’Driscoll SW, Jupiter JB, Cohen MS, Ring D, McKee MD. Difficult elbow fractures: pearls
 397 and pitfalls. *Instr Course Lect.* 2003;52:113-134.
- 398 12. Patterson SD, Bain GI, Mehta JA. Surgical approaches to the elbow. *Clin Orthop.*
 399 2000;(370):19-33. doi:10.1097/00003086-200001000-00004
- 400 13. Rasband WS. ImageJ. *US Natl Institues Health Bethesda Md USA.* Published online 2018
 401 1997. <https://imagej.nih.gov/ij>

Modified Taylor-Scham Versus FCU-Split

- 402 14. Regan W, Morrey B. Fractures of the coronoid process of the ulna. *J Bone Joint Surg Am.*
403 1989;71(9):1348-1354.
- 404 15. Ring D. Fractures of the coronoid process of the ulna. *J Hand Surg.* 2006;31(10):1679-1689.
405 doi:10.1016/j.jhsa.2006.08.020
- 406 16. Ring D, Doornberg JN. Fracture of the anteromedial facet of the coronoid process. Surgical
407 technique. *J Bone Joint Surg Am.* 2007;89 Suppl 2 Pt.2:267-283.
408 doi:10.2106/JBJS.G.00059
- 409 17. Ring D, Jupiter JB. Surgical Exposure of Coronoid Fractures. *Tech Shoulder Elbow Surg.*
410 2002;3(1):48-56.
- 411 18. Sanchez-Sotelo J, O'Driscoll SW, Morrey BF. Medial oblique compression fracture of the
412 coronoid process of the ulna. *J Shoulder Elbow Surg.* 2005;14(1):60-64.
413 doi:10.1016/j.jse.2004.04.012
- 414 19. Shukla DR, Koehler SM, Guerra SM, Hausman MR. A novel approach for coronoid
415 fractures. *Tech Hand Up Extrem Surg.* 2014;18(4):189-193.
416 doi:10.1097/BTH.0000000000000065
- 417 20. Smith GR, Altchek DW, Pagnani MJ, Keeley JR. A muscle-splitting approach to the ulnar
418 collateral ligament of the elbow. Neuroanatomy and operative technique. *Am J Sports Med.*
419 1996;24(5):575-580. doi:10.1177/036354659602400503
- 420 21. Taylor TK, Scham SM. A posteromedial approach to the proximal end of the ulna for the
421 internal fixation of olecranon fractures. *J Trauma.* 1969;9(7):594-602.
422 doi:10.1097/00005373-196907000-00004

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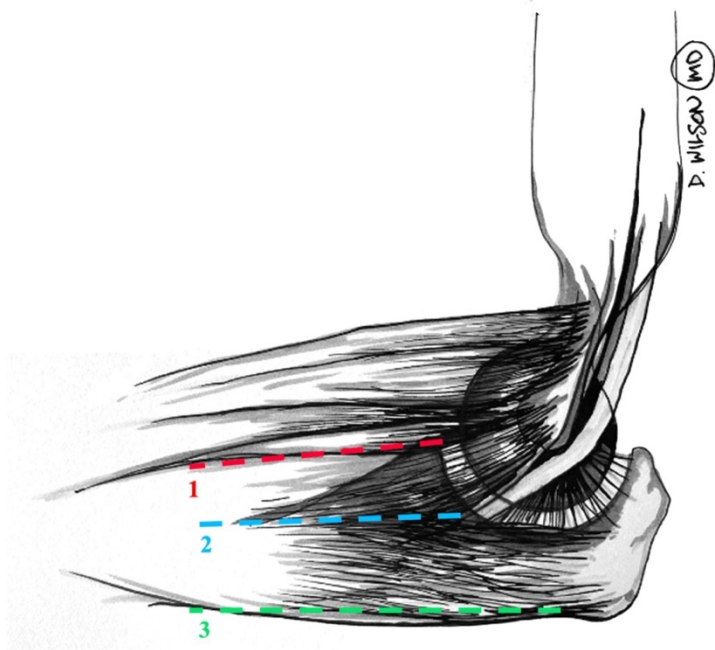
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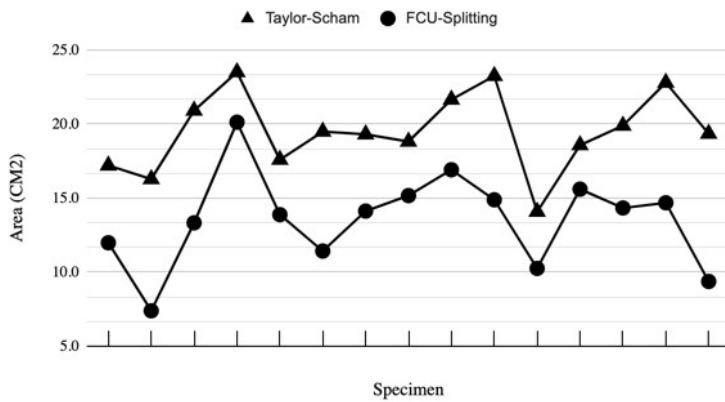
432 **FIGURE LEGENDS**



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434 Figure 1 Surgical intervals of the medial elbow. Hotchkiss Over-the-Top (1, red), Flexor Carpi

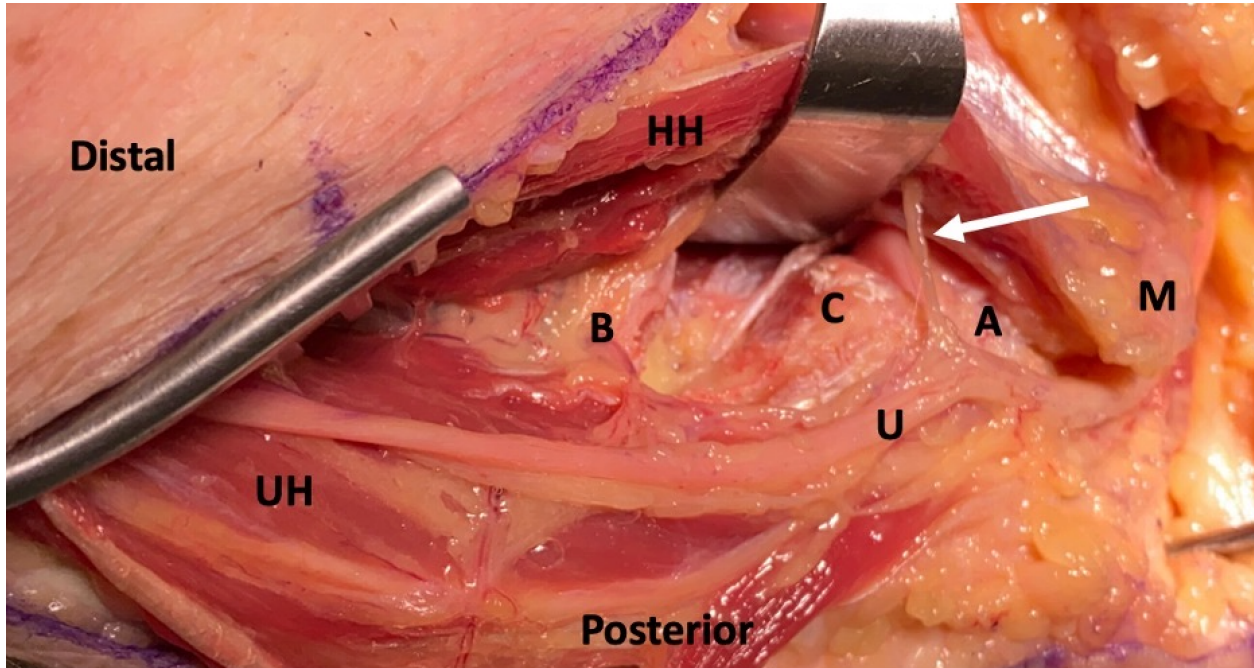
435 Ulnaris (FCU) Splitting (2, blue), Taylor-Scham (3, green)



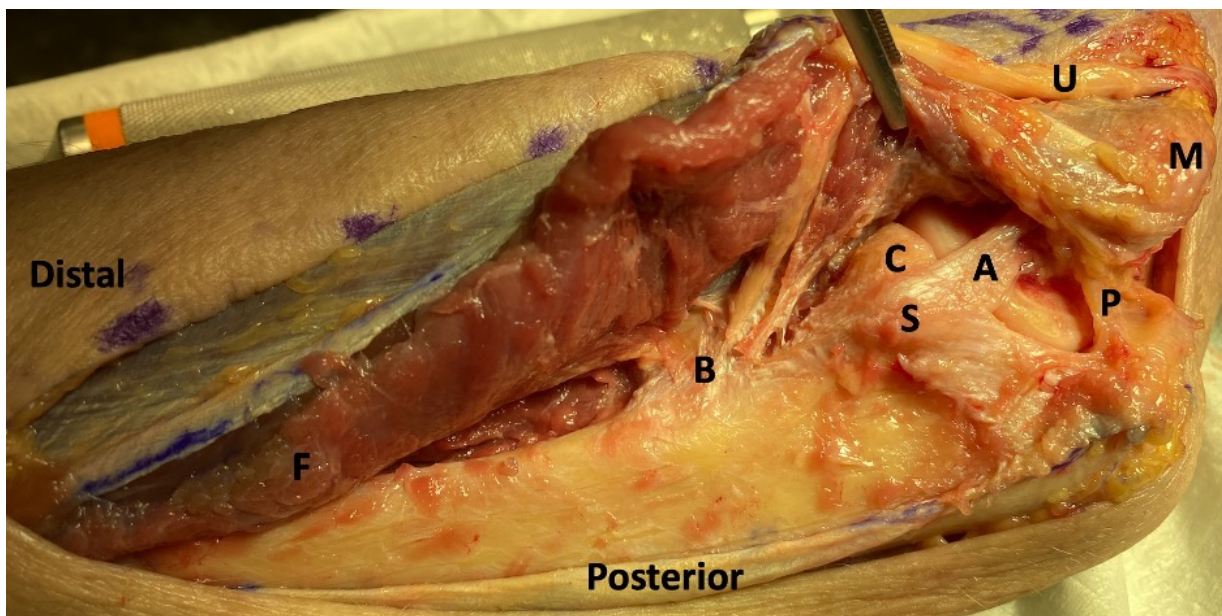
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437 Figure 2 Area of osseous exposure (cm²) for the Taylor-Scham and FCU-Splitting approaches in

438 each of the 15 cadaveric specimens.



439
440 Figure 3 The FCU-Splitting approach allows exposure to the coronoid process (C) but requires
441 management of the ulnar nerve (U) and its branches, including the first motor branch to the FCU
442 (arrow). Medial epicondyle (M), anterior band of MCL (A), brachialis tendon (B), humeral head
443 of FCU (HH), ulnar head of FCU (UH).



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445 Figure 4 The Taylor-Scham approach with ulnar nerve (U) transposition demonstrating access to
446 the proximal anteromedial ulna including the coronoid process (C), sublime tubercle (S), anterior
447 bundle of MCL (A), posterior bundle of MCL (P), medial epicondyle (M), brachialis tendon (B),
448 and flexor muscle mass (F).

449

450 TABLE LEGENDS

451 Table 1: Specimen Demographics

Average age (range), years	76.7 (58-97)	
Gender	<i>Male</i>	<i>Female</i>
	9	6
Laterality	<i>Right</i>	<i>Left</i>
Taylor-Scham	7	8
FCU-Split	8	7

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453 Table 2: Osseous Exposure

Cadaver No.	Taylor-Scham	FCU-Split
	Area Exposed (cm ²)	Area Exposed (cm ²)
1	17.2	12.0
2	16.3	7.4
3	20.9	13.3
4	23.5	20.1
5	17.6	13.9
6	19.5	11.4
7	19.3	14.1
8	18.8	15.2
9	21.6	16.9

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10	23.2	14.9
11	14.1	10.2
12	18.6	15.6
13	19.9	14.3
14	22.8	14.7
15	19.3	9.3

454

455 Table 3: Comparison of the Modified Taylor-Scham and FCU-Split

	Modified Taylor-Scham	FCU-Split
Quantitative Exposure (cm ²)	19.5	13.6
Access to coronoid process	Yes	Yes
Access to sublime tubercle	Yes	Yes
Requires transposition of ulnar nerve	Yes	Variable
Requires direct retraction of ulnar nerve	No	Yes
Requires sacrifice of ulnar nerve branches	No	Variable
Distally extensile	Yes	No

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