

## Single Posterior Incision Approach to the Repair of Partial Distal Biceps Ruptures: A Case Series

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**Introduction:** Complete distal biceps ruptures are commonly treated via either a single anterior incision (SAI) or a dual incision (DI) approach utilizing both anterior and posterior incisions. Partial ruptures with failed nonoperative management or poor supination strength may necessitate surgical management. The SAI or DI approach is frequently utilized for partial rupture repairs due to excellent visualization of the tendon. The aim of this study was to assess the single posterior incision posterior (SPI) approach for operative management of partial ruptures and discuss conversion to DI approach in cases of unexpected complete rupture.

**Methods:** This study was conducted at a single tertiary referral extremity surgery practice. A retrospective chart review was performed on 12 patients who underwent surgery for a partial distal biceps rupture. These procedures were performed by a single physician with an initial SPI approach, and intraoperative conversion to two incisions as necessary for management of unexpected complete rupture with pseudotendon formation. Data collected included demographic information, comorbidities, injury characteristics, procedural data, and pre/post-surgery clinical evaluation. Patients were contacted to report long term follow up outcomes as well. Descriptive statistics were employed to analyze the data.

**Results:** Of the 12 patients included in the study, all were male and 4 received conversion to DI approach. For all 12 patients, the average long term follow-up Quick Disabilities of Arm, Hand, and Shoulder (QuickDASH) score was 4.2 (0 - 20.5), Patient-Rated Elbow Evaluation (PREE) total score was 9.5 (0 - 42), and pain scale rating was 1.2 (0 - 10) (Table 1). Five patients reported their condition to be much improved, with two of these respondents having had conversion. One patient reported no change in their condition and had intraoperative conversion. Zero patients required revision surgery. Regarding preoperative variables, the average time between injury and operative treatment was 150.3 (23 - 402) days with patients receiving conversion undergoing surgery earlier on average. The average preoperative QuickDASH score was 48.75 (9.1 - 93.2) overall, 54.06 (20.5 - 93.2) for those who did not receive conversion, and 36.37 (9.1 - 77.5) for those who received conversion. The mean operative time was one hour and nine minutes (0:52 - 1:29) for procedures which did not require addition of the anterior incision, and one hour and forty minutes (1:30 - 1:57) for those that did. There was one minor complication in a patient who underwent conversion to the DI approach. Individual QuickDASH scores, surgical characteristics, strength, and range of motion measurements were similar for all patients. The demographic characteristics for all 12 patients were similar.

**Discussion:** This case series showed the SPI approach with possible intraoperative DI conversion to be an effective option for partial distal biceps repair. Compared to the DI approach, this technique requires less soft tissue dissection. If pseudotendon or complete rupture is encountered, conversion to the DI approach appears safe, and only extends operative time by 30 minutes on average. Limitations include small sample size and limited long term data.

**SIGNIFICANCE / CLINICAL RELEVANCE:** Starting with a single posterior incision for partial distal biceps tendon tears reduces soft-tissue dissection and yielded excellent long-term function without revision in this cohort. When pseudotendon or a complete rupture is encountered, conversion to a planned dual-incision exposure is safe and typically adds only about 30 minutes, providing a practical, low-morbidity pathway for repair.

**Table 1.** Descriptive statistics of postoperative variables and outcomes for the 12 patients in our series.

Variable	All (n=12)	No Conversion (n=8)	Conversion (n=4)	
Successful telephone follow up contact	6 (50.0%)	3 (37.5%)	3 (75.0%)	
Length of telephone follow up contact, days	1,836.3 (958.0 - 2,738.0)	1,774.7 (958.0 - 2,738.0)	1,898.0 (1,290.0 - 2,717.0)	
QuickDASH	4.2 (0.0 - 20.5)	1.6 (0.0 - 4.6)	6.8 (0.0 - 20.5)	
PREE (total)	9.5 (0.0 - 42.0)	5.0 (0.0 - 15.0)	14.0 (0.0 - 42.0)	
Pain score	1.2 (0.0 - 5.0)	0.7 (0.0 - 2.0)	1.7 (0.0 - 5.0)	
Anchor-based question	Much worse	–	–	
	Slightly worse	–	–	
	No change	1 (8.3%)	–	1 (25.0%)
	Slightly improved	–	–	–
	Much improved	5 (41.7%)	3 (37.5%)	2 (50.0%)
Length of in-person follow up, days	244.3 (70.0 - 655.0)	241.5 (70.0 - 655.0)	249.8 (98.0 - 467.0)	
Complications	1 (8.3%)	0 (0.0%)	1 (25.0%)	
Revisions	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Future surgeries to same extremity	1 (8.3%)	1 (12.5%)	0 (0.0%)	

