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## Multicenter study of clinical outcomes after reverse shoulder arthroplasty among patients with deltoid rupture

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### Introduction and Background

In reverse shoulder arthroplasty (RSA), the deltoid muscle plays a crucial role in elevation and joint stability, and deltoid rupture has traditionally been considered a contraindication. However, recent reports have shown favorable outcomes even in patients with deltoid deficiency. This multicenter study aimed to investigate the association between deltoid rupture and postoperative outcomes after RSA, and to clarify the relationship between the extent of rupture and poor clinical results.

### Material and Method

Patients who underwent RSA at seven institutions and were followed for at least 1 year postoperatively were included. Cases with fracture, nonunion, dislocation, tumor, prior shoulder surgery, or axillary nerve palsy were excluded. On preoperative MRI, cases with complete discontinuity of the deltoid were classified as the “rupture group,” and those with clearly preserved continuity as the “no-rupture group.” Cases with only thinning and unclear continuity were excluded. Patient demographics, postoperative range of motion, muscle strength, and Constant-Murley score were compared between groups. In the rupture group, the deltoid origin was divided into seven segments (Figure 1), and clinical outcomes were assessed according to rupture extent.

### Results

There were 154 shoulders in the no-rupture group and 14 in the rupture group, with no differences in baseline characteristics. Postoperative forward flexion was 124° vs 113°, external rotation 25° vs 23°, internal rotation T12 vs L2, abduction strength 45.4 N vs 37.2 N, and Constant-Murley score 62.8 vs 57.6, with no significant differences. Thirteen shoulders with rupture involving  $\leq 2$  segments showed favorable outcomes, whereas one shoulder with rupture involving 3 segments had poor outcomes (Table 1). No postoperative dislocations occurred in the rupture group.

### Conclusions

Deltoid rupture is not necessarily an absolute contraindication for RSA, particularly when the rupture is localized. However, in cases with extensive rupture, elevation may remain limited and additional procedures may be required.



Figure & Table 1.

Figure 1. MRI-based assessment of deltoid rupture in seven segments

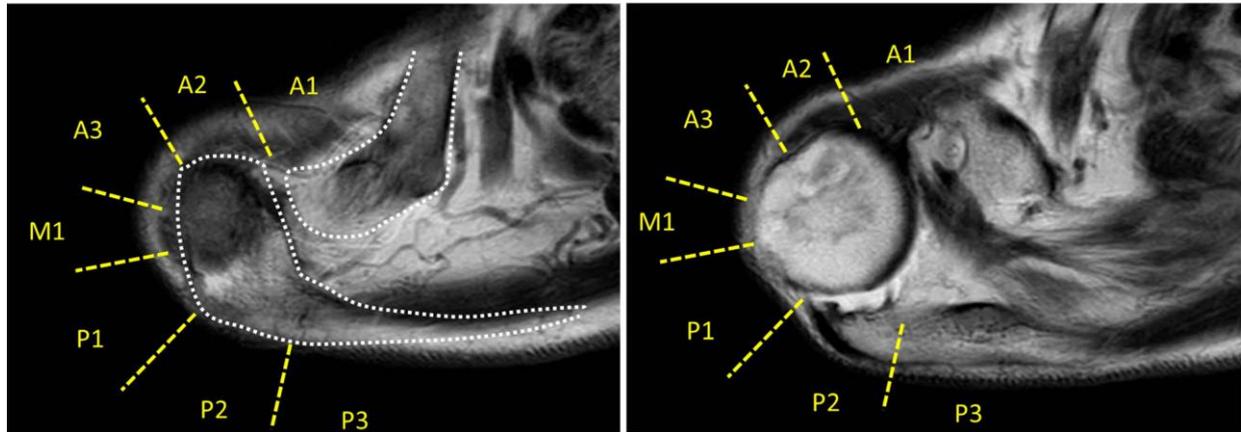


Figure & Table 2.

Table 1. Clinical outcomes according to the number of deltoid rupture segments

Segment		One (n=9)	Two (n=4)	Three (n=1)
ROM	Flex (° )	113 ± 26	131 ± 13	40
	ER (° )	20 ± 18	23 ± 22	50
	IR	L1 ± 4	L4 ± 4	L4
Muscle strength	Abd (N)	39.5 ± 17.8	38.4 ± 23.1	14.0
	ER (N)	20.7 ± 18.3	27.0 ± 12.5	11.0
Constant-Murley score		63.8 ± 20.1	58.0 ± 8.5	32