

Functional outcomes after reverse shoulder arthroplasty. A systematic review comparing anterosuperior and deltopectoral surgical approaches.



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Introduction

- Reverse shoulder arthroplasty (RSA) has been increasing in popularity over the last 20 years. It is the most popular shoulder arthroplasty procedure.¹
- A major benefit of the RSA over the anatomic total shoulder arthroplasty (TSA) is that it can be performed for an expanding number of indications, some of which have been historically difficult to treat.^{2,3}
- The two most common approaches for the RSA are the deltopectoral (DP) approach and the anterosuperior (AS) approach.

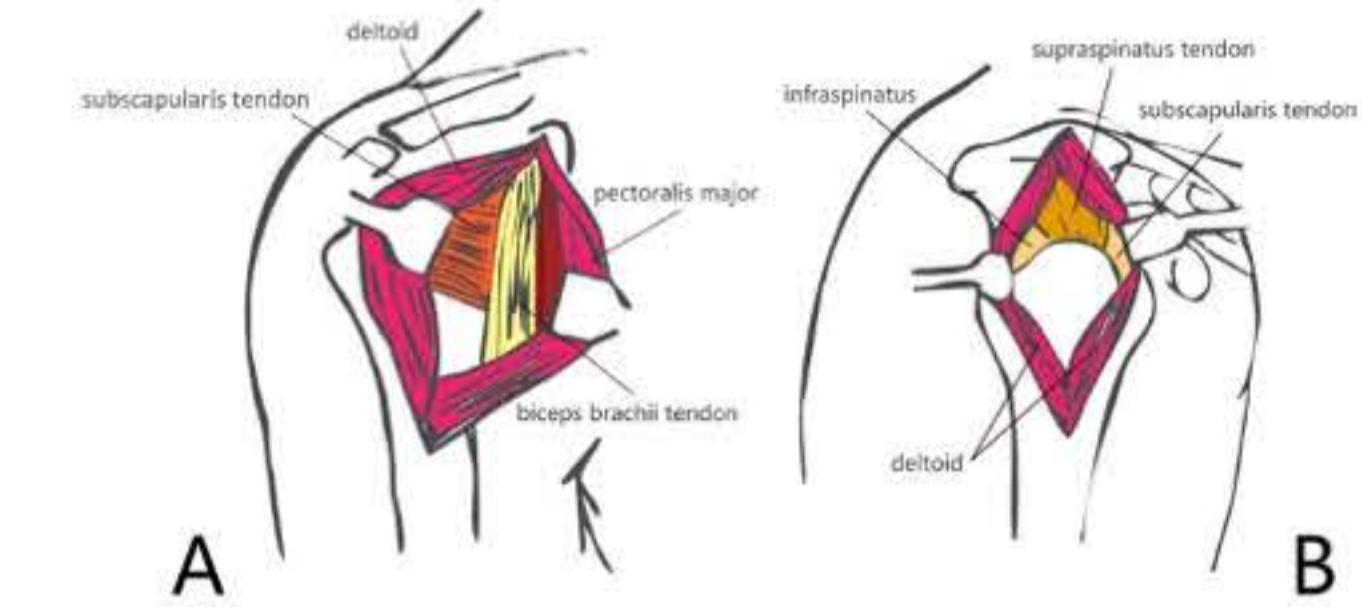


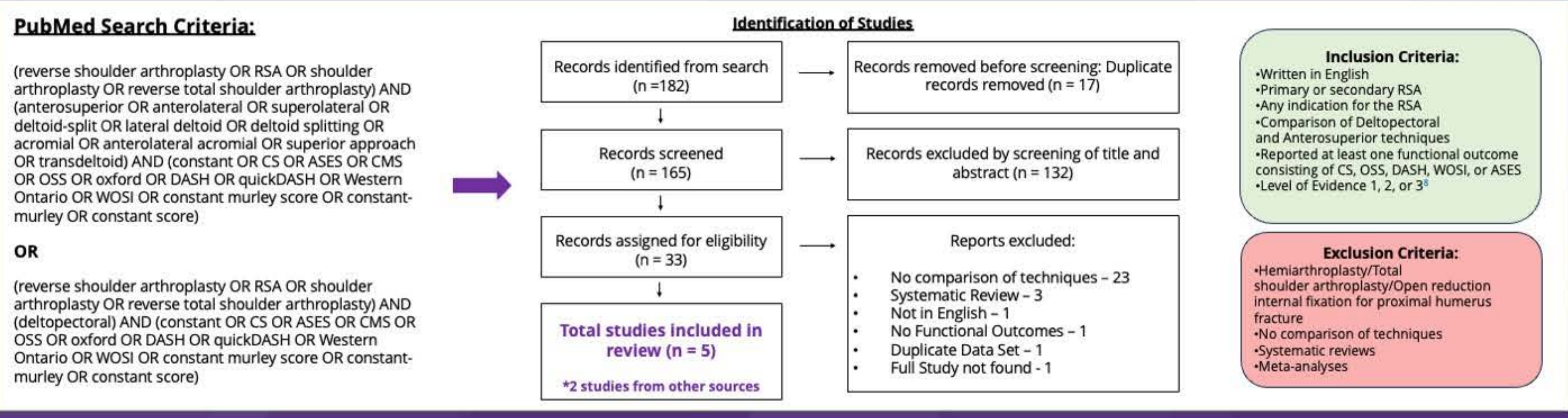
Fig. 1. Deltopectoral approach (A) and anterosuperior approach (B)⁶

- DP approach uses an incision along the deltopectoral groove. The subscapularis tendon and long head of biceps must be tenotomized or carefully displaced.⁴
- AS approach incision is along the deltoid's anterior and middle thirds. Incision is limited to 5 cm distal to the acromion to reduce risk of axillary nerve damage.⁵
- Alternate names for the AS approach include anterolateral, deltoid-split, superolateral, acromial, superior, and trans-deltoid.^{4,6,7}
- CS, OSS, DASH, WOSI, and ASES are functional outcomes to assess patient response to shoulder procedures.

Purpose

To assist orthopedic surgeons and patients in selecting the type of RSA to perform, functional outcomes must be compared. The goal of this review is to provide a better understanding of the expected patient functionality following deltopectoral or anterosuperior RSA.

Methods



Results

Table 1 Functional Outcome Appraisal

	Test Descriptions						
	SCALE	Direction	Description	Validity	Reliability	MCID	SEM
CS/Constant	0-100	Higher / Better	10 Items (Exam, Subjective)	Construct, Criterion, ¹² Content ¹²	Very Good ICC 0.8-0.87 ⁹	5.7 ¹³	8.2 ⁹
ASES	0-100	Higher / Better	34 Items (Exam, Subjective)	Content, Construct ¹²	Very Good ICC 0.84-0.96 ¹³	13.6 ¹³	6.7 ²¹
DASH	0-100	Higher / Worse	30 Items (Exam, Subjective)	Content, Construct, Criterion ¹²	Excellent ICC 0.93-0.98 ¹⁰	10.2 ¹¹	3.5 ²²
OSS	0-48	Higher/Worse	12 Items (Exam, Subjective)	Construct ¹²	Excellent ICC 0.98 ¹⁴	4.3 ¹⁶	3.3 ¹⁸
WOSI	0-2,100	Higher / Worse	21 Items (Exam, Subjective)	Construct ¹²	Excellent ICC 0.91-0.95 ¹⁵	126.4 ¹⁷	130.6 ¹⁹

Table 2 Results Summary

STUDY	TYPE	CASES	FOLLOW-UP	SUMMARY	MINORS
Godeneche et al., 2023	Retrospective cohort study	501 (413 DP, 88 AS)	Minimum 2-year follow-up (2.0 to 5.5 years) Mean 3.2 ± 0.9 years	AS approach worse Constant scores	21
Torrens et al., 2021	Randomized trial	98 (49 DP, 49 AS)	2-year follow-up	No difference Constant scores	23
Izquierdo-Fernandez et al., 2021	Prospective cross-sectional cohort study	32 (13 DP, 19 AS)	1-year follow-up 7-year follow-up	No difference Constant scores	20
Aibinder et al., 2018	Retrospective cohort study	109 (22 DP, 87 AS)	Minimum 2-year follow-up (2.0 to 9.9 years) Mean 3.7 years	No difference ASES	18
Schuette et al., 2022	Retrospective cohort study	29 (16 DP, 13 DS)	Minimum 1-year follow-up Mean 28.6 ± 19.9 months DP Mean 21.1 ± 9.5 months DS	No difference ASES	20

Description of assessments used to evaluate shoulder function. Minimal clinically important differences (MCID) are patient derived scores that reflect changes in interventions that are clinically significant.

Constant Score:

- Introduced to determine the functionality after the treatment of a shoulder injury, irrespective of diagnosis.
- Four subscales: pain (15 points), activities of daily living (20 points), strength (25 points) and range of motion: forward elevation, external rotation, abduction and internal rotation of the shoulder (40 points).

ASES:

- ASES score includes direct questions regarding both pain and function.
- One fifteen-item question for pain, one fifteen-item question for function, and the four-item question for perceived improvement.

Functional outcomes comparing DP and AS approaches for RSA. (“DS” (Schuette et al. study) is synonymous with “AS”). MINORS is a valid instrument designed to assess the methodological quality of non-randomized surgical studies, whether comparative or non-comparative (scored out of 24).²³

Discussion/Conclusion

- A database query of PubMed provided 33 papers that met inclusion and exclusion criteria. Five studies were included in the review.
- Out of five functional outcomes, CS and ASES are two functional outcomes utilized by the studies (table 2).
- One study found statistical significance that the AS approach was worse than the DP approach when comparing post-operative and net improvement in CS.²⁴ The reported outcome was greater than the MCID, suggesting clinical significance (table 1, table 2).
- Although similar studies comparing the anterosuperior vs deltopectoral approaches for RSA are available^{5,7,25}, their focus is on ROM, hardware positioning, and complications. Data comparing functional outcomes of these approaches is limited. Further studies need to be performed to better understand the benefits and consequences of each surgical approach in respect to post-operative function.

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