DELTOID PROBLEMS AND REVERSE SHOULDER ARTHROPLASTY

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MAIN PROBLEMS

Bone defect

Muscle damage

Tendon damage

Nerve damage
DELTOID PROBLEMS

Deltoid problems usually arise from:

previous surgical approaches or partial or complete nerve damage

- Anterior part is often affected after anterior approaches
- Lateral part often affected after superolateral approaches or lateral acromionectomy

Sher JS, Iannotti et al, CORR. 1997;(343):93-8
REVERSED PROSTHESSES

Courtesy R Nyffeler
REVERSED PROSTHESSES

Courtesy R Nyffeler
ROLE OF THE DELTOID PARTS

LVDT → ds

Courtesy R Nyffeler
MUSCLE LENGTH ADDUCTION

deltoid longer

M1  M2  M3  M4  M5  M6  M7

0 cm  5 cm  10 cm  15 cm  20 cm

Courtesy R Nyffeler
MUSCLE LENGTH 90° ABDUCTION

Deltoid mostly shorter

M1 M2 M3 M4 M5 M6 M7

0 cm 5 cm 10 cm 15 cm 20 cm

Courtesy R Nyffeler
VARIATION OF MUSCLE LENGTH DURING ABDUCTION

Courtesy R Nyffeler
HOW MUCH LESION IS ACCEPTABLE?

Gulotta LV, JBJS B: 2012:94B:1666

Schwartz DG, JSES 2013
How much lesion can be accepted for RTSA?

For **abduction**:
Loss of anterior part may be accepted, increase of subscapularis load by 195% in 30°, 82% in 60°

Gulotta LV, JBJS B; 2012;94B:1666

For **flexion**:
Anterior deltoid must be present, however loss of 50% of anterior deltoid may be accepted.

Schwartz DG, JSES 2013
SEQUELAE OF CUFF TEAR

Rare, but possible sequel of RCT.

Involvement of steroid injections?
REPAIR IN RTSA

3 Cases (of 199 RTSA) with spontaneous anterior deltoid failure after previous cuff surgery and subsequent deltoid repair

Result: some residual pain, but flexion of 120°

Consideration of superolateral approach
Results of repair in 24 patients (*without RTSA*):

4% excellent, 29% good, 67% unsatisfactory

Sher, Ianotti et al, CORR 1997, 343, 93-98
REPAIR OF THE DELTOID

Irreparable cuff tear and deltoid necrosis after steroid infiltration
REPAIR OF THE DELTOID

Latissimus transfer and direct repair of the deltoid
Latissimus transfer and direct repair of the deltoid
Direct deltoid repair for middle defect
If not possible:

Result: Flexion: 48° to 120°, ER from 12° to 22°; 1/6 failure.

Penn shoulder score from 45 to 78 points, 5/6 satisfied with RTSA

Marinello, Iannotti, JSES 25, 2016
Prerequisite: at least 1 RC muscle with function. 6/10 with forward flexion > 90° (study without prosthesis)

Itoh Y, Fukuda: JBJS
Goel DP, JSES 2012; 21e1
LATISSIMUS FLAP TRANSFER WITH RTSA

1 year f-up

Itoh Y, Fukuda: JBJS
Goel DP, JSES 2012; 21e1
OTHER PROBLEMS: ACROMIONECTOMY

Tricortical bone graft

Forsythe, Warner; CORR 2009
OTHER PROBLEMS:
ACROMIONECTOMY

9/9 unions
Good pain reduction VAS 8 -> 1
ASES score 31 -> 68
1 needed revision for re-attachment of deltoid
REPAIR OF THE DELTOID

*With RTSA:* If possible, direct repair is attempted, postoperative care with abduction brace

→ If treated early, favourable results (3 of 3; Whatley)

If repair is not possible, muscle transfers can be considered, including:

- trapezius
- latissimus dorsi
- teres major
- coracobrachialis
- biceps triceps
- pectoralis major
- deltid shift

Sher, Ianotti et al, CORR 1997, 343, 93-98
Goel DP, JSES 2012; 21e1
Marinello, Iannotti, JSES 25, 2016