

No. 12

Humeral and Glenoid Defects in Shoulders with Anterior Instability

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I. Historical Review

- Glenoid defects (bony Bankart lesion)
 - Fracture
 - Erosion
- Humeral defects
 - Malgaigne 1855
 - Hill & Sachs 1940

II. Glenoid Defects

A. Background

- Incidence: 8%~90%
- erosion 40%, fragment 50% assessed by 3D-CT⁸
- How large a defect should be when bone grafting is necessary?

B. Cadaveric Study⁵

- Created anteroinferior defect stepwise with a width of 12.5%, 25%, 37.5%, and 50% of the glenoid length (diameter of the circumference of the glenoid)
- Stability & ER motion: significantly affected when
 - glenoid defect >21% of the glenoid length

C. CT Assessment of the Defect Location⁶

- 3D-CT assessment of location and direction of the defect
- Location of the defect: 2:30~4:20 (12:08~6:32)
- Direction of dislocation: 3:01 relative to the glenoid

D. Cadaveric Study¹¹

- Stability ratio measured with various sizes of the glenoid defect (0, 2, 4, 6, 8 mm) created at 3 o'clock position parallel to the long axis of the glenoid
 - Significant decrease in stability ratio when the defect size was 6 mm and 8 mm
 - 6-mm defect = 20% of the glenoid length or 27% of the glenoid width

III. Humeral Defects

- Incidence: 25%~100%
- Anatomical studies: x-ray, CT, MRI
 - Location of Hill Sachs lesion⁷:
 - Width: 22 mm
 - Depth: 5.0 mm
 - Orientation: 7:58 (6:46~8:56)
- "Glenoid track" = contact between the glenoid and the humeral head during arm elevation in max ER¹⁰
 - Width of the "glenoid track" in normal shoulders: avg 85% of the glenoid width
- Indication for surgery:
 - Involvement of articular surface:
 - 20%~50% (reverse Hill Sachs)³
 - 40% < (Hill Sachs)⁴
 - glenoid track < Hill Sachs¹⁰
- Management: bone graft¹, rotational humeral osteotomy⁹, soft tissue tightening^{2,3}

IV. My Preferred Management

- Glenoid defect (mid-range instability)
 - Fragment type → Bankart repair with a bony fragment
 - Erosion type → Defect size > 21% of the glenoid length or 25% of the glenoid width
 - Bone graft: coracoid transfer (Latarjet) or iliac bone graft

● Hill-Sachs lesion (end-range instability)

- Glenoid track w/ defect or w/ graft > Hill Sachs → no Rx
- Glenoid track w/ defect or w/ graft < Hill Sachs → Bone graft or soft tissue tightening

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