

Glenoplasty for recurrent posterior shoulder instability

Good results in 13 cases followed for 1–16 years

Johannes H J M Bessens and Joost Vegter

After the failure of closed treatment, 13 shoulders in 10 patients with chronic posterior shoulder instability had an open wedge osteotomy of the collum scapulae, with interposition of an autologous graft from the iliac crest.

After a median follow-up of 9 (1–16) years, there were no recurrent posterior luxations or signs of instability. All patients were satisfied, but 3 had slight pain after strenuous work. All had a full range of motion.

Department of Orthopedics and Traumatology, Elkerliek Hospital, Wesselmanlaan 25, 5707 AB Helmond, The Netherlands
Tel +31 492-595527. Fax -595396
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Several different operative techniques for treating unidirectional posterior instability of the shoulder have been suggested and the results vary (Matsen III et al. 1990). Good results have been reported with collum scapulae osteotomy (Scott 1967, Vegter and Marti 1981). We have modified this technique by interposition of an extended autologous graft in the osteotomy.

Patients and methods

Between 1978 and 1994, we operated on 10 patients with recurrent posterior shoulder instability, 3 of them on both shoulders in different sessions. There were 8 men and 2 women and their average age was 19 (15–27) years. 5 right and 8 left shoulders were involved, with an equal distribution between dominant and non-dominant. All but 3 patients (cases 1, 10 and 12) had mild pain in the shoulder pre-operatively. Closed treatment has failed in all patients.

Case 5 had had a complicated proximal humerus fracture 5 years prior to the glenoplasty. 2 patients had a generalized ligamentous laxity with posterior instability (1 unilateral, 1 bilateral) in the glenohumeral joint. At follow-up after 9 (1–16) years, all patients completed a questionnaire about their complaints and functional abilities and were given physical and radiographic examinations. We used objective scoring by the Rowe and Zarins' method (1981).

Operative technique

A posterior approach (Wirth et al. 1993), was used with the patient under general anesthesia, placed on

the contralateral side. After capsule exposure, the joint is opened and the curvature of the glenoid can be judged. With a thin-bladed reciprocating saw, a shallow trough of 2 cm is made in the posterior cortical bone just medial and slightly inferior to the posterior edge of the glenoid (subchondral). With a chisel and spreader, the opening is spread about 15 degrees in the sagittal plane. A 2 by 3 cm bone block, partially cortical, partially cancellous, is taken from the inner side of the iliac crest. This is shaped to fit the opening created in the collum scapulae. With a blunt probe, the bone block is punched into the collum. The concave shape of the extending part forms a continuation of the posterior glenoid (Figure 1). This modification

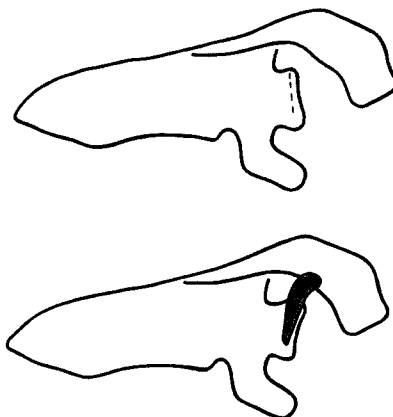
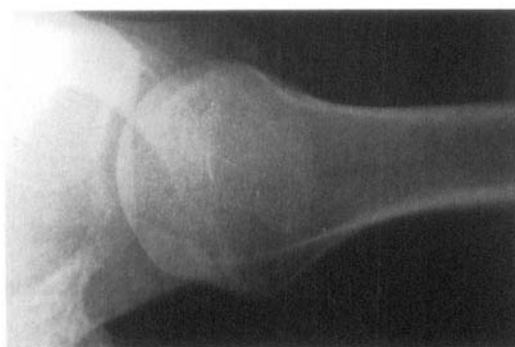


Figure 1. Posterior glenoplasty. Preoperative location of the osteotomy (top). An iliac bone graft holds the subchondral collum scapulae osteotomy and creates a stable buttress extending the posterior edge of the glenoid (bottom).

Figure 2. Case 4. Axial radiographs of glenoplasty in a 27-year-old man.



Preoperatively.



After 62 months. Redirection and extension of posterior glenoid.

is comparable to the technique Alvik (1948) used for the anterior glenoid, except for the fact that Alvik had no intention of redirecting the glenoid. Thus a stable construction is created which does not need additional fixation. In the first 6 cases, the after-treatment consisted of a thoracobrachial cast for 2-6 weeks. The last 7 only had a mitella for 2-4 weeks. 9 cases were given physical therapy after immobilization for a period of 10-26 weeks.

Results

After an average follow-up of 9 (1-16) years, the results of 12 cases were classified as excellent and 1 as good (case 1), according to Rowe and Zarins (1981). 1 patient had slight limitation when throwing. 3 patients complained of slight pain during or after strenuous work. All had a full range of motion and had returned to work. None of the patients had recurrent luxation or signs of instability at the time of follow-up. 1 patient who was operated on bilaterally, had a tendency towards posterior subluxation of the right humeral head, 5 months after the operation on that side. With intensive physical therapy, the shoulder became stable. After an initially fair result, the patient's shoulder, at 6 years follow-up, was also classified as excellent.

We observed no complications, such as subcoracoid impingement symptoms, anterior instability, intraarticular fracture, perforation or avascular necrosis of the glenoid and migration or resorption of the graft (Scott 1967, Hawkins et al. 1984, Johnston et al. 1984, Gerber et al. 1985).

On follow-up radiographs, only 1 patient had slight degenerative changes.

Discussion

Many authors consider soft-tissue procedures alone to be insufficient for symptomatic unidirectional posterior instability (Tibone and Ting 1990, Hurley et al. 1992). Bone-block procedures and glenoid osteotomies, with or without capsular shift or infraspinatus and teres minor advancement, generally lead to a better outcome (Scott 1967, Norwood and Terry 1984, Brewer et al. 1986, Hernandez and Drez 1986, Toolanen et al. 1990). Excessive retroversion of the glenoid, which may be seen on axial radiographs, is a structural variation related to posterior instability (Brewer et al. 1986, Hurley et al. 1992). Redirection in these cases seems logical. The initial treatment, however, should always be given by closed means.

General laxity is not an absolute contraindication for surgical treatment since unidirectional instability of the glenohumeral joint is very disabling. Ahlgren et al. (1978) treated a patient having general joint laxity, with a posterior bone graft. The subjective result was good, even if this patient suffered residual instability and slightly decreased mobility. Our excellent results in 3 cases show that an operation can be successful, although Norwood and Terry (1984) stated that an opening wedge osteotomy is contraindicated in congenitally or habitually lax shoulders.

We performed no concomitant procedures, such as capsulorrhaphy, as done by Hawkins et al. (1984) and English and Macnab (1974). Due to the redirection of the glenoid, the posterolateral surface of the humeral head moves slightly laterally and, as a consequence, strains the exorotator muscles. Because of our blunt exposure without release of these muscles and the deltoid muscle, functional after-treatment is possible. We chose a redirection angle of about 15 degrees. This is slightly less than suggested by some authors (Scott 1967, Brewer et al. 1986) and may explain

why we saw no post-operative subcoracoid impingement symptoms (Gerber et al. 1987) or anterior instability (Scott 1967). The use of a cancellous graft of the iliac crest has several advantages: its natural concave shape extends the dorsal glenoid surface and it is rapidly incorporated. We agree with Brewer et al. (1986) that the use of a bone graft of the acromion is not advisable. This may induce subacromial subluxation, especially when the arm is in anteflexion (Thomas 1937).

Part of the after-treatment should be intensive physical therapy to strengthen the infraspinatus, teres minor and subscapularis muscles. In the single case of initial failure, this helped to create stability, producing an excellent result after all, with no subluxation in the postexercise period. It shows once again the importance of both dynamic and static stabilizing elements (Saha 1971).

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