Iliac Bone Graft for Recurrent Posterior Shoulder Instability with Glenoid Bone Defect

Sang-Hun Ko, Yun-Jae Cho
Department of Orthopedic Surgery, Ulsan University Hospital, Ulsan, Korea

Recurrent posterior shoulder instability is a debilitating condition that is relatively uncommon, but its diagnosis in young adults is increasing in frequency. Several predisposing factors for this condition have been identified, such as the presence of an abnormal joint surface orientation, an osteochondral fracture of the humeral head or glenoid cavity, and a postero-inferior capsuloligamentary deficit, but their relative importance remains poorly understood. Whilst, conservative treatment is effective in cases of hyperlaxity or in the absence of bone abnormality, failure of conservative treatment means that open or arthroscopic surgery is required. In general, soft-tissue reconstructions are carried out in cases of capsulolabral lesions in which bone anatomy is normal, whereas bone grafts have been required in cases where posterior bony Bankart lesions, glenoid defects, or posterior glenoid dysplasia are present. However, a consensus on the exact management of posterior shoulder instability is yet to be reached, and published studies are few with weak evidence. In our study, we report the reconstruction of the glenoid using iliac bone graft in a patient suffering recurrent posterior shoulder instability with severe glenoid bone defect.

(Clin Shoulder Elbow 2014;17(4):190-193)

Key Words: Joint instability; Posterior; Bone graft; Ilium

Case Report

A 21-year-old male visited our Hospital due to discomfort from recurrent dislocation of the posterior shoulder on the right side. According to patient history, the patient experienced the initial posterior dislocation 4 years ago from an external trauma, and subsequently experienced continued discomfort and shoulder instability during exercise, as well as recurrent posterior dislocation. According to physical examination, the functional ability of the shoulder joint was decreased due to these recurrent dislocations. The patient’s range of motion decreased substantially, where forward elevation was at 40 degrees, and external rotation was at 15 degrees. Also, the patient scored positive in all of the following tests for shoulder stability; the jerk test, the posterior drawer test, and the posterior apprehension test. According to X-ray, the right posterior shoulder was dislocated and posterior glenoid bone defect was observed. This was confirmed...
by dual-energy computed tomography (DECT), in which dislo-

cation of the right posterior shoulder was observed and posterior
glenoid bone defect was observed in at least 50% towards the
left side. Besides, no abnormalities were observed in the rotator
cuff or the biceps tendon (Fig. 1). The surgery method used was
as follows; first, the patient was given general anesthesia and
placed into the correct position. The patient was placed in a lat-
eral position towards the left, and the body slanted backwards at
an angle of approximately 30 degrees so that the shoulder was
perpendicular to the floor. Secondly, key anatomical structures
such as the coracoid process, the clavicle, and the scapular spine
were marked. Afterwards, an incision of around 15 cm was
made along the axillary line, above and across the shoulder joint,
and another incision was made through the soft tissue. At this
point, the arm was externally rotated to an angle of 90 degrees
and the posterior deltoid lifted up, which was then approached
via the deltoid splitting approach and pulled up in order to ex-
pose the infraspinatus muscle and teres minor muscle. Each of
these muscles was then pulled to the opposite sides, and the
posterior capsuloligament approached through here. Then, the
posterior capsuloligament was cut into a T-shape, through which
the posterior glenoid was reached. The membrane of the gle-
noid bone was peeled off and flattened so as to secure an area
onto which the autograft was attached. The transplant used was
an iliac bone, measuring 2 cm in length and 3 cm in thickness,
obtained from the eastern side of the iliac crest. The bone graft
was appropriately situated onto the area of deficit and fixed
using two cannulated screws of approximately 3.5 mm in size.
The shape of the bone graft was then polished using a grinder to
fit into the glenoid space. Furthermore, stability was confirmed
by approximating the range of motion of the shoulder joint.
Here, we found that the postero-inferior capsuloligament was
loose, so plication was carried out using an ethibond. After the
surgery, the patient was given an abduction brace with a cush-
ion on the abdominal area to block internal rotation, and with
this blocked, he was started on partial passive joint exercise and
rehabilitative treatment from day one after surgery. The patient
used the abduction brace for 6 weeks after surgery, and was al-
lowed to return to his daily routine after 3 months.

In the follow-up at 4 months and 1 year after surgery, both

Fig. 1. (A, B) X-ray showing bone defect of the posterior glenoid cavity & posterior dislocation of the shoulder joint. (C) Computed tomography (Proton density axial view) showing severe bone defect of the posterior glenoid and posterior dislocation of the shoulder joint.

Fig. 2. (A, B) Postoperative X-rays showing glenoid reconstruction using iliac bone graft with AO 3.2 mm cannulated screws. (C) Computed tomography showing well-united bone graft and reduced glenohumeral joint.
X-ray and DECT showed union of the posterior bone graft, and showed no signs of pseudoarthrosis, osteolysis, osteophyte, loss of joint space, and osteoarthritis (Fig. 2). In the physical examination, the patient scored negative in the Jerk test, the posterior drawer test and the posterior apprehension test. Also, the range of joint motion was largely increased compared to pre-surgery levels, and was within normal range. Furthermore, the patient no longer experienced pain or instability.

**Discussion**

Posterior shoulder instability comprises of approximately 4% of all shoulder instabilities, and its treatment is known to be difficult. For the treatment of posterior shoulder instability, Beall et al. have incorporated proprioceptive sensation training and neuromuscular reprogramming in early physiotherapeutic treatment, through which the supraspinatus, infraspinatus and/or the deltoïd muscles are strengthened, so as to achieve functional stability. They report a recovery rate of up to 80% in cases where inherited bone deformities are absent. However, they also report that if glenoid bone defect is severe or recurrent shoulder joint dislocation is long-term, surgery is required. Capsulorrhaphy reported good outcomes in the short-term, but is only relevant to cases where external trauma and glenoid bone deformities are absent. Glenoid bone osteotomy is a technically difficult surgery, and Hawkins et al. observed complications in approximately 20% of patients, and dislocations in 41% of patients after surgery.

Conversely, posterior bone graft may be considered as a last resort when all other surgeries have failed. For this surgery, iliac bone from the eastern iliac crest can be utilized, or alternatively, transplantation using the trapezius musculocutaneous flap or the bone from the eastern iliac crest can be utilized, or alternatively, resort when all other surgeries have failed. For this surgery, iliac surgery.

In our case study, a young and active male patient did not benefit from conservative treatment of over 6 months, and experienced clinically severe posterior glenoid bone defect and posterior shoulder instability. Therefore, an autogenous iliac bone graft was used for glenoid reconstruction. The patient did not acquire any complications, and achieved good clinical results as seen by recovery of shoulder stability, loss of pain and so forth. Our case study showed a successful clinical outcome, and so we report this case with a literature review.

**References**