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Appendix

Supplementary Data 1:

Test set-up:

Triangular rigid fixation plates were screwed on the subscapular and infraspinous fossa of the scapula and fixed with a self-centring vice. The vice was secured on four linear railed platforms (TRS15VN, TBI Motion Technology, Taipei, Taiwan) placed parallel to the glenoid's posterior-anterior axis and attached by pre-stretched rope (Dyneema HMPE) to the crosshead of a LR5K universal testing machine (Lloyd Instruments Ltd, Segensworth Fareham, England) equipped with a XLC 5KN loadcell (Lloyd Instruments Ltd, Segensworth Fareham, England) exceeding the requirement of EN ISO 7500-1 class 0.5. A frictionless pulley was used to transfer the crosshead motion in the vertical, load axis to the horizontal, posterior-anterior axis of the glenoid. The proximal humerus was rigidly fastened at its shaft with a tailor-made fixture that allowed precise placement of the humeral head in the glenoid cavity. The humeral fixture was attached to four vertically placed linear railed platforms and loaded with weights to allow a downforce of 50N(1–3) on the glenoid ensuring that the humeral head finds it original neutral anatomical position in the glenoid cavity. This neutral position was defined as the starting position for each test. During the mechanical test, a preload of 1N was applied, before the crosshead moved posteriorly to cause anterior translation of the humerus at a set rate of 1.0 mm/sec for a total of 10mm.(4,5) The load and displacement were recorded with NEXYGEN data acquisition software (Lloyd Instruments Ltd, Segensworth Fareham, England). Afterwards the maximum translational peak force for each test was determined.

Supplementary data 2:

Surgical method:

One author and orthopedic surgeon (TB), with more than 5 years' shoulder surgery experience performed all the procedures. First, the dissected specimens were tested in the normal condition to evaluate the translational peak force in the anatomic situation. After this, the shoulders were made unstable by creating the anterior bone defect. To make such an anterior glenoid osteotomy, the subscapularis tendon was incised vertically, approximately 1.0 to 1.5 cm medial to its insertion, leaving the inferior part intact. The capsule was incised vertically on the lateral side. A blunt dissection of the capsule was made from the subscapularis tendon, after which a L-shaped capsular opening was made, raising one big superomedial capsular flap. By doing this, good visualization of the shoulder joint was reached with the intact labrum and biceps anchor on the superior side of the glenoid. The glenoid bone defect was created perpendicular to the joint surface with a patient specific cutting template. Before testing every condition the arthrotomy (capsular flap and subscapularis tenotomy) was restored by means of single knotted vicryl stitches, followed by testing measurements of the situation.

To restore the original anatomy with the patient specific implant, the implant was fixated extra-articularly on top of the capsular flap on the anterior aspect of the glenoid defect by means of two locking screws (36mm, ø3.5mm, DePuy Synthes). To enhance the glenohumeral stability

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with the classic Latarjet procedure, the inferior surface of the coracoid was fixed to the anterior surface of the glenoid as described by Montgomery et al.(6) The Latarjet procedure was performed by means of cannulated partially threated screws (ø3.75), drill guide and wedge profile plates from a Latarjet set (Arthrex, Naples, USA).

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