Inverted Total Shoulder Arthroplasty for Traumatic Shoulder Arthritis

Sir,

The shoulder joint is the most flexible ball-and-socket joint in the body. Trauma to the shoulder is a major risk factor for the progressive development of osteoarthritis in the shoulder, often leading to progressive osteoarthritis, which is often referred to as traumatic arthritis.[1] Since its clinical application in 1985, reverse shoulder arthroplasty has become an effective treatment for end-stage shoulder diseases, such as rotator cuff-tear arthropathy and shoulder osteoarthritis.[2] Studies have shown that reverse shoulder arthroplasty can effectively relieve shoulder pain and promote functional recovery, showing good clinical efficacy. The ideal shoulder replacement should maximise the range of motion of the joint and restore good soft tissue balance while ensuring the stability of the prosthesis.

A 66-year old female suffered a fracture of the proximal left humerus due to a fall 11 months ago and underwent open reduction and internal fixation of the proximal left humerus fracture in a local hospital. X-ray, CT, and MRI of the left shoulder joint showed a bone defect in the left scapula, internal fixation of the proximal fracture of the left humerus, and traumatic arthritis of the left shoulder joint (Figure 1).

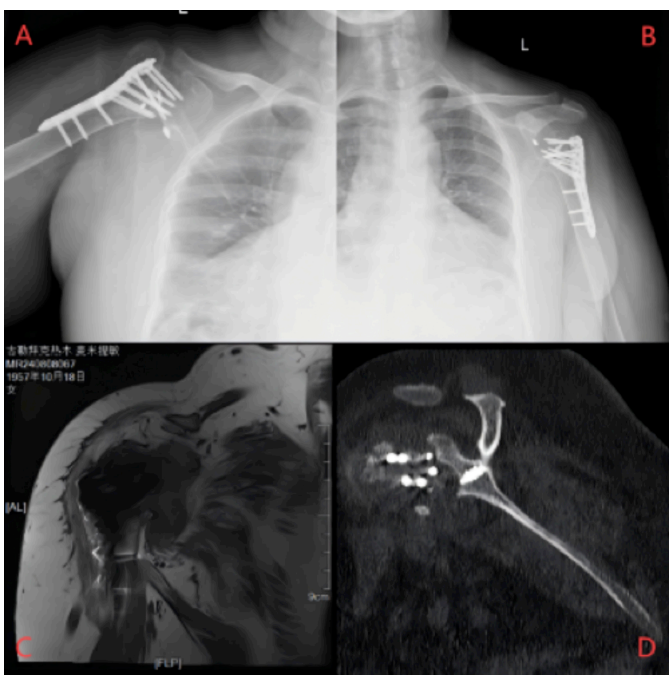

Figure 1: (A) X-ray of the patient's left shoulder following the previous operation. (B) Preoperative x-ray of the patient's left shoulder. (C) One of the sections of the patient's left shoulder MRI before surgery showing a ruptured left rotator cuff. (D) A section of the patient's left shoulder CT before surgery showing severe bone damage in the left scapula.

The final diagnoses were: Left traumatic shoulder arthritis and after internal fixation of the left proximal humerus fracture, avascular necrosis of the humeral head. Treatment decided was left-side inverted-shoulder arthroplasty.

After general anaesthesia, the patient was positioned in the beach chair position. The left upper limb was then routinely disinfected and draped. An incision was made along the deltopectoral groove, and the layers were carefully separated to protect the surrounding vascular and nerve structures. The glenoid side was prepared by filling the bone defect with autologous iliac bone, after which a metal base was installed and secured at the scapular site. The humeral side was then addressed, and an appropriate prosthesis was implanted (Figure 2). Finally, the wound was closed in layers.

The Constant-Murley shoulder function score was 66 points when the patient came to our hospital for re-examination one month after surgery, and the patient's recovery was good (Figure 3).

Reverse total shoulder arthroplasty is considered one of the most influential technological innovations in shoulder reconstructive surgery over the past 40 years, and it is effective in relieving shoulder pain and dysfunction caused by shoulder disease.[3,4] However, reverse shoulder arthroplasty is also a complex and technically difficult operation, and once it fails, salvage methods are extremely limited, and its postoperative complications cannot be ignored.[5,6]

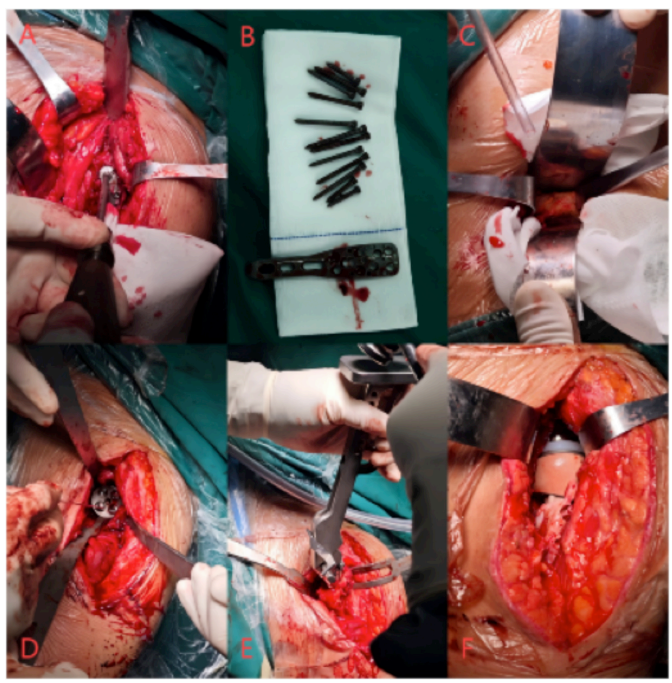

Figure 2: (A) Internal fixation device removed during surgery. (B) Removed proximal humerus locking titanium plate and 12 screws. (C) Taking autologous bone from the iliac bone and implanting it into the glenoid defect. (D) Installation and screw fixing of the metal base at the glenoid. (E) Treatment of the humeral side and implantation of the prosthesis. (F) Successful reduction of the anti-shoulder prosthesis.

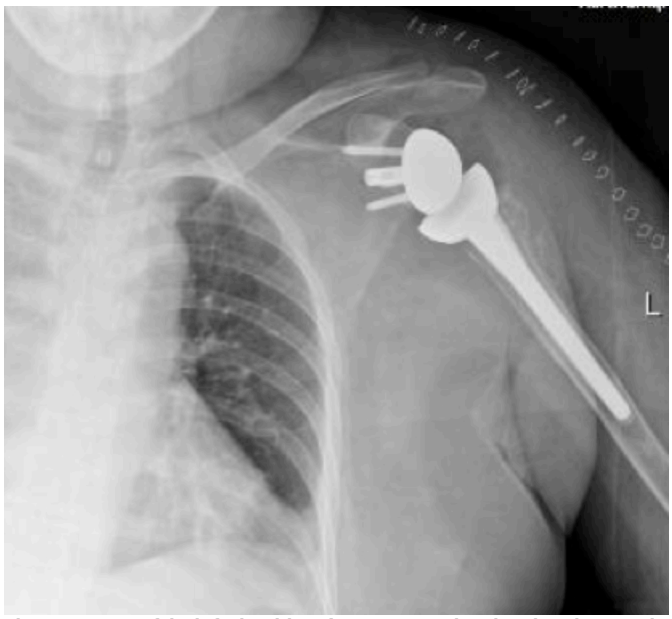

Figure 3: X-ray of the left shoulder after surgery, showing that the prosthesis is in good position.

The difficulty of this operation mainly lies in the treatment of the glenoid and the placement of the glenoid prosthesis. The placement of the glenoid base should follow the principle of rather go down than up, that is, the base should be placed slightly below the glenoid, so that the spherical prosthesis placed on the base can cover the lower edge of the glenoid, avoiding the impact between the humeral prosthesis and the glenoid below, and prolonging the life of the prosthesis. In addition, the direction in which the two screws of the glenoid base are driven is crucial, which determines the stability of the base in the early stage. Special attention should be paid to the fact that due to the small area of the scapular glenoid and the large diameter of the two screws, there is usually only one chance to place the screw, and the position and direction of the screw must be grasped in advance. It is not recommended to adjust the direction of the screw or the nail point twice, otherwise, it is very easy to cause the loss of glenoid bone volume and the early loosening of the base due to improper positioning during the operation.

COMPETING INTEREST:

The authors declared no conflict of interest.

AUTHORS' CONTRIBUTION:

LZ: Conceptualisation, data curation, formal analysis, investigation, methodology, project administration, resource management, supervision, validation, visualisation, writing of the original draft, reviewing, and editing.

MMA: Data curation, formal analysis, and investigation.

KJ: Writing of the original draft, reviewing, and editing.

RS: Writing, reviewing, and editing.

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