Long-Term Outcomes After Deltoid Muscle Flap Reconstruction For Massive Cuff Rotators Tears

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Backgrounds
The rotator cuff degenerative tears are very common. Nevertheless, the management of chronic irreparable tears in young patients under 65 years old remains a major challenge. Several procedures have been proposed, including alia, tendon transfers. In massive rotator cuff tears, deltoïd flap reconstruction has likely proved its efficiency in pain relief and function improvement in the shoulder.

Objectives
The purpose of this study is to report our experience with management of irreparable rotator cuff tears in consecutive series of deltoïd flap transfers performed between 1994 and 2007 with a mean follow-up of 75 months.

Methods
In a retrospective study, we reviewed the charts of 27 patients younger than 65 years old at surgery. All patients have exclusively performed deltoïd muscle flap reconstruction for massive rotator cuff tears, between 1994 and 2007. The mean follow-up was of 75 months. Each of the 27 patients underwent a pre-operative and a post-operative evaluation including Constant score determination, standard radiographs, ultrasoneography and MRI or CT scan of the shoulder.

Results
Mean patient age at surgery was 54 years. There were 16 men and 11 women. Of the 27 patients, three were physically inactive, fifteen were heavy manual labourers, and 12 had less strenuous manual jobs. Mean time from symptom onset to surgery was 14.7 months. The dominant extremity was involved in 21 patients. Before surgery, cranial migration of the humerus was noted 9 times. None of the patients showed signs of glenohumeral arthritis. We reported 4 cases of acromiohumeral arthritis.

At a mean follow-up of 7 years and 5 months, 77% of patients considered the condition of their shoulder as better or much better compared with before surgery. The mean global Constant and Murley Score improved with a mean gain of 30 points from 24.5 to 54.5 points. The mean pain score increased from 4.5 to 11 points. Active range of motion improved (11.2 points), but gains were minor especially in external rotation. However, the strength remained unchanged. The mean subacromial space decreased from 8.9 mm to 4 mm at last follow-up. Of the 12 patients whose flap was examined by magnetic resonance imaging, 9 had no tear and a flap signal of muscle intensity. The mean flap thickness was 7.9 mm.

Discussion
Due to the importance of function of the shoulder and the fact that the deltoïd is the main abductor of this joint, there has been a reluctance to utilize this muscle in the past. We sought to compare our results to published data on deltoïd flap reconstruction. In term of pain relief, our findings showed analgesic effect of deltoïd transfers for chronic, irreparable rotator cuff tears at long-term follow-up. These outcome regarding pain reflects the results of previous studies. We think that this analgesic effect can be related to the wide sub-acromial decompression and debridement of the tears. While pain relief is consistent and reproducible, neither the range of motion nor the strength increased significantly comparing pre-operative and follow-up data. This is in accordance with the literature, reporting good results on pain but no significant improvement in strength or motion. Concerning cranial migration, this procedure was enabled to prevent it according to our data. The same findings were reported in many studies although the original inventors of this technique proposed that the use of a synergistic muscle could prevent cranial migration of the humeral head.

Conclusions
This study showed that the use of the deltoïd flap transfer procedure for chronic, retracted, and irreparable rotator cuff tears is disputable. However, our findings demonstrated the efficiency of the deltoïd flap for the treatment of full thickness massive tears of the rotator cuff, in term of pain relief and functional recovery. The flap provides persistent pain relief and good function improvement.

References