

# Preoperative and Postoperative Management of Arthroscopic Rotator Cuff Repair

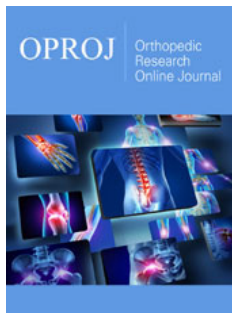
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## Opinion

Considerable advances have been made in arthroscopic rotator cuff repair (ARCR) over the last decade and excellent results have been achieved. Although recent studies have shown that functional outcomes after ARCR are comparable with those after open or mini-open repair, further refinements that could improve the clinical outcome of ARCR have been widely debated. Various factors can affect the clinical results, some medical, such as operative technique and preoperative and postoperative management, and others patient-related, such as tear size and the presence of diabetes or preoperative contracture. Though efforts have been focused on resolving the medical factors, patient-related factors should also be addressed.

A number of complications of ARCR have been reported, one of the most common of which is persistent shoulder stiffness. Although loss of shoulder mobility after ARCR is widely recognized, the relationship between clinical management and shoulder stiffness is poorly understood. We believe that appropriate preoperative management and postoperative rehabilitation are as important as surgical technique and should be able to achieve good results.

## Preoperative management

Preoperative contracture is one of the factors affecting the final result of rotator cuff repair. The frequency of preoperative contracture has been reported to be 10%-25%, although the definitions used have not been consistent [1-5]. Persistent limitation of range of motion (ROM) after ARCR is more likely in patients with preoperative contracture than in those without [2]. Several investigators have recommended methods for improving preoperative stiffness in patients with rotator cuff tear, including improvement of ROM by preoperative rehabilitation before ARCR [3], intraoperative manipulation [4], and simultaneous arthroscopic release of the capsule if the contracture is severe [5]. Each of these methods has been reported to have good results.

On the other hand, many patients have both daytime and nighttime aching pain that disturbs sleep and requires anti-inflammatory medication. Patients with spontaneous pain before surgery often continue to have pain after surgery, which can impede effective rehabilitation. Some studies suggest that this pain is related to clinical inflammation in the shoulder joint or bursa [6,7]. Intra-articular corticosteroid injections [8] and injections into the subacromial bursa [9] have been reported to be effective in patients who have this type of inflammatory pain preoperatively, control of which affects the final outcome [10]. Therefore, preoperative inflammatory pain should be managed appropriately, while taking into account the risks of infection associated with corticosteroid injections and structural failure.

## Postoperative management

It is widely known that rehabilitation in the early stage after ARCR has a favorable effect on the clinical outcome. Although Koo et al. [11] suggested that inappropriate immediate postoperative care can result in postoperative contracture [11], there is ongoing debate about

the postoperative treatment protocol. Some authors recommend immediate passive motion exercise starting immediately after surgery [12] while others have reported that 6 weeks of immobilization produces better results than immediate passive motion [13]. However, shorter period of immobilization and excessive rehabilitation may increase the risk of postoperative structural failure. A histological study in a primate model by Sonnabend et al. [14] found that a considerable number of Sharpey fibers appeared to be healed at 8 weeks and that the bone and tendon were held together by 12-15 weeks. They suggested that the rehabilitation protocol in humans should be mild for at least 12-15 weeks after surgery to allow sufficient tendon-to-bone healing to protect the surgical repair [14]. We have reported that 120° of forward flexion and 20° of side-lying external rotation should be the minimum target ROM at 3 months after surgery, regardless of whether patients undergo active rehabilitation or immobilization [15]. Our experience has been that the outcome at 2 years postoperatively is less favorable in patients who do not reach this ROM target than in those who do, but that there is no significant difference in the re-tear rate. Appropriate rehabilitation is important for achieving this target ROM and attaining good results. Forced exercise and excessive motion that produces pain should be avoided. Physiotherapy should be performed to mitigate the tonus of the outer muscles and promote flexibility of the shoulder girdle, including the muscles around the scapula, ribs, and thoracic vertebrae. Physiotherapy should then progress to include circular movement of the shoulder joint while reducing trick movements. We consider that performing appropriate physiotherapy is essential, especially in the early stage after surgery.

In summary, it is desirable to improve the patient's ROM and to manage inflammatory pain to the extent possible before performing ARCR. If the ROM cannot be improved preoperatively, additional treatment is required. Appropriate postoperative rehabilitation is also necessary. Training to a level that causes pain should be avoided.

### Conflict of Interests

The author declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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