Neurogenic Thoracic Outlet Syndrome: Why I combine open and arthroscopic release: preliminary results

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Background and Aim

Neurogenic symptoms of thoracic outlet syndrome (TOS) can be associated, both preoperatively and postoperatively, with shoulder pain and Scapulothoracic Abnormal Motion (STAM). A study by M. Merle et al. reported that 23 to 33% of patients with subacromial impingement and 7 to 19% of patients with superior trapezius contracture had these conditions both preoperatively and postoperatively in a series of 100 neurogenic TOS cases treated with open supraclavicular release of the brachial plexus. We hypothesized that this open supraclavicular technique, when combined with arthroscopy to release the pectoralis minor and explore the subacromial space and glenohumeral joint, would result in less STAM and shoulder pain. We present the preliminary results of a monocentric prospective study involving 20 patients.

Methods

Between 2021 and 2023, 20 patients (17 women, 3 men), mean age 37 years (range 13-52), underwent an open supraclavicular release of the brachial plexus combined with arthroscopy to release the pectoralis minor and explore and treat shoulder pathology. Preoperatively, neurogenic TOS was associated with subacromial impingement in 35%, superior trapezius contracture in 45%, painful pectoralis minor in 75% and STAM in 15%. Intraoperatively, we performed arthroscopic subacromial impingement bursectomy (SAB) and acromioplasty in 4 cases, and biceps tenodesis in 3 cases. We systematically released the pectoralis minor and the subclavicular muscle. In one case, we identified a Caldani ligament and in another, a fibrous band at the superior border of the pectoralis minor. Postoperative rehabilitation to strengthen the rhomboids and serratus anterior, and to correct scapular protraction, began 2 weeks post-surgery.

Results

Twenty patients were included, with a follow-up period ranging from 6 to 36 months (mean:20 months). 85% of neurogenic symptoms disappeared, including headaches and paresthesias of the upper limb after one month, and improved strength and reduced finger numbness after six months. In this first prospective monocentric study, we observed no STAM postoperatively, one case of capsulitis, and one case of subacromial impingement.75% were very satisfied, 10% satisfied and 15% disappointed (numbness IV V Fingers and no strength).

Conclusion

Open supraclavicular brachial plexus release, combined with shoulder arthroscopy for pectoralis minor and subclavicular muscle release, as well as treatment of subacromial impingement and biceps lesions, is an effective procedure. A longer follow-up, a larger series, and a control group are required to confirm the favorable clinical outcomes and the reduced incidence of shoulder complications with this new technique.