The modified Eden-Lange procedure for paralysis of the trapezius muscle

Trapezius felcinde modifiye Eden-Lange prosedürü: Olgu sunumu

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Trapezius muscle paralysis results from injury to the spinal accessory nerve. Impairment in the trapezius muscle function may destabilize the muscle resulting in winged scapula. A 25-year-old university student who was active in sports had complaints of shoulder drop and pain on abduction. He had a three-year history of fall resulting in a scapular fracture for which he received conservative treatment. Physical examination showed asymmetry and drop of the right shoulder. Lateral scapular winging was apparent particularly above 90° of abduction. Electromyography revealed isolated paralysis of the trapezius muscle. The patient underwent reconstruction with the modified Eden-Lange procedure. After a two-year follow-up, asymmetry in the shoulder decreased, there was no pain on active abduction, and the patient returned to active sports and was fully satisfied with the outcome.

Key words: Accessory nerve/injuries; electromyography; muscle, skeletal/transplantation; paralysis/surgery; scapula; shoulder.

The aim of this study is to allow the treatment of an active sportsman with rarely seen trapezius paralysis by using Eden-Lange procedure, and therefore, to discuss the trapezius paralysis from all aspects.

Case report

A University student (25) who deals with sports (volleyball player with license) applied because of looseness in his shoulder and pain in the abduction. The complaint of the patient has been continued for about two years. The patient stated that his pains increased especially while serving and smacking, and that he could not make sports for the last three months. The medical center to which he applied advised him...
muscle strengthening exercises due to rotator cuff lesion pre-diagnosis, and anti-inflammatory drugs were prescribed. In the background analysis, it was determined that he had an unchanged scapula fracture due to falling down three years ago, and he had a conservative treatment for a period of time, however his complaints appeared after that time.

Owing to his increasing complaints, the patient applied to the medical center, and it was diagnosed that there was an asymmetry and looseness in the right shoulder compared to the left shoulder (fig 1). It was observed that the right scapula developed winging, obviously, by moving towards the lateral especially after 90° abduction. The joint movement wideness of the patient was normal. The active shoulder abduction was full but it was found too much painful over 90°. No pain was observed in the forward elevation of the arm. In the EMG of the patient, the isolated paralysis was diagnosed in the trapezius muscle.

In order to stabilize the scapula, Eden-Lange procedure was applied. Under the general anesthesia the patient was placed at lateral decubitus and slightly forward slant position. The trapezius muscle which was at atrophic situation was found between the vertebra spine projecting part and scapula medial side, and even through the incision from the upper part to the lower part of the scapula. Then the stick was removed. At the lower part the levator scapula and rhomboid muscles separated from each other and were cut from the stuck point with little bone piece. Then the supraspinatus and infraspinatus muscles were peeled off from their beds to the lateral half of the scapulae. The minor rhomboid muscle was transferred to the supraspinatus fossa and the major rhomboid muscle was transferred to the infraspinatus fossa. During the said transfer, three bone anchor sutures were used for the major rhomboid and one was used for the minor rhomboid in order to be placed at 5 cm lateral from the scapula medial edge. The anchor sutures were placed obliquely from the medial to the lateral because the scapula body was too thin. The sutures were tightened when the arm was at 90° abduction and when the scapula was at reduced position. The infrasupinatus and supraspinatus muscles were sewed over the rhomboid muscles.

The upper part of the spina lateral was reached through the second incision of nearly 5 cm from the post lateral corner of the acromion and 3 cm from the medial. From that point, a tunnel was opened through the medial, and the levator scapula muscle was threaded through the fibers of trapezius muscle. Then, the muscle was fixed on the spina by a bone anchor suture allowing 5 cm from the acromion. After closing the layers adequately, the immobilization was applied with an abduction cushion.

After the operation, the arm was taken on the rack for 6 weeks. Passive range of motion exercises were started as soon as possible. The abduction cushion was put in the sixth week and the active tightening exercises started. At the end of two years of follow-up, the shoulder asymmetry decreased, the pains at the active abduction reduced and the patient restarted his active sports life with satisfaction (fig 2).

**Discussion**

The trapezius muscle is a large muscle that starts from the seventh cervical vertebra and extends to the twelfth thoracic vertebra. The upper part of the muscle sticks 1/3 distal of the clavicle. That part elevates the clavicle and accordingly the scapula by pulling

![Figure 1. There is an asymmetry of the neck and looseness in the right shoulder with the trapezius paralysis.](image1)

![Figure 2. Longitudinal incision at the midline of the spinous process and the medial rim of the scapula and transvers incision at the lateral part of the scapula over the spinous scapula. Abduction pain disappeared completely in the postoperative period](image2)
The electromyography (EMG) had a significant role in determining the level of injury in the diagnosis of paraplegia. The modified Eden-Lange procedure for paralysis of the trapezius muscle was performed in 1971 in chronic trapezius paralysis. The modified Eden-Lange procedure is a dynamic muscle transfer procedure. In the treatment of the trapezius paralysis, exercises that increase the range of motion and physical therapy are applied. Conventional treatment is applied in patients with long-term trapezius dysfunction. Tchou et al. [8] offer surgical treatment in patients with long-term trapezius dysfunction. In surgical treatment, nerve repair or grafting is applied. In spontaneous trapezius paralysis, the conservative treatment is indicated instead of surgery because of complications such as atrophy of muscle fascia in the trapezius and pseudohypertrophy. In the treatment of patients who have no sufficient result at one year, reconstrucive surgery is recommended. In this condition, surgery is indicated even if some patients have passed three years. In the treatment of the trapezius paralysis, exercises that increase the range of motion and physical therapy are applied. Conventional treatment is applied in patients with long-term trapezius dysfunction. Tchou et al. [8] offer surgical treatment in patients with long-term trapezius dysfunction. In surgical treatment, nerve repair or grafting is applied. In spontaneous trapezius paralysis, the conservative treatment is indicated instead of surgery because of complications such as atrophy of muscle fascia in the trapezius and pseudohypertrophy. In the treatment of patients who have no sufficient result at one year, reconstrucive surgery is recommended. In this condition, surgery is indicated even if some patients have passed three years.
out that it was more effective. In this modification supraspinatus fossa is transferred instead of minor rhomboid muscle infraspinatus, accordingly, reconstruction of medial part of trapezius is obtained, and upper edge of the medial scapula is stabilized. Major rhomboid reconstructs the lower part of trapezius, and levator scapula reconstructs the upper part. In our fact, rather satisfactory result has been obtained as a result of two years of follow-up. Scapular winging and cervix asymmetry decreased, and the abduction pain ceased. The patient has returned to his active sport life six months after the application of the procedure.

Consequently the Eden-Lange procedure is a good dynamic muscle transfer that decreases the pain of the patient and allows normal life quality in late term trapezius paralysis.

References