

MUSCLE TRANSPOSITION IN SERRATUS ANTERIOR PARALYSIS

By

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Winged scapula or scapula alata follows paralysis of the Serratus anterior muscle and is characterized clinically by a prominence of the vertebral border and inferior angle of the scapula and by an inability to lift the arm above shoulder level. The muscle is innervated by the long thoracic nerve. Paralysis may be due to trauma, neuritis or progressive muscular atrophy.

Therapeutically, an abduction splint or figure of eight bandage and physiotherapy are first employed. In those cases where the paralysis continues, two types of surgical procedures have been used; scapular fixation, and muscle transposition. The method evolved by Hass belongs to the latter group, in which the Teres major muscle is transposed to restore the function of the parietic Serratus anterior muscle.

The Serratus anterior muscle takes its origin from ribs 1-8 beneath the Pectoralis minor muscle, and is inserted into the inferior angle and vertebral border of the scapula, (see fig. 1). The Teres major, which is innervated by the subscapular nerve, takes its origin from the inferior angle of the scapula and is inserted on the crest of the lesser tuberosity of the humerus, somewhat dorsally and distally to the insertion of the Latissimus dorsi.

The operation is carried out as follows: see figs. 2 and 3.

An incision is made in the axilla parallel with the posterior fold. After the neurovascular structures have been carefully retracted, the Teres major is freed subperiosteally from its humeral insertion. Through a second incision on the upper lateral thorax, the 5th and 6th ribs are exposed at the level of origin of the Serratus anterior. By means of a suture the humeral end of the Teres major is now drawn across the

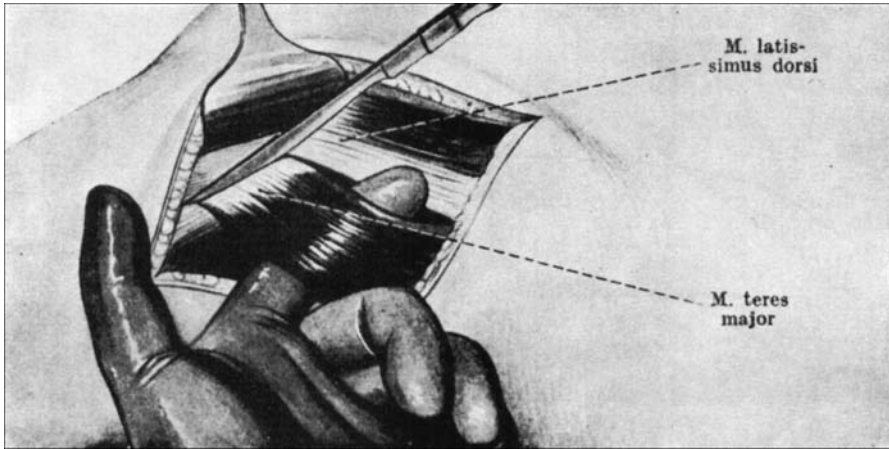


Fig. 2.

Release of the insertion of the Teres major from the humerus.

In all cases the operation was performed under general anaesthesia. Post-operatively the arm was maintained in abduction for 6 weeks; then physiotherapy was begun.

At the follow-up three of the patients stated that they were enthusiastic about the results of the operation, one was satisfied and one was dissatisfied.

Four of the patients were able to return to their previous work and declared that they had only insignificant trouble from the shoulder, such as a feeling of tiredness after working with the arm above the horizontal level, or smarting pain from the new muscle insertion on the ribs.

On objective examination it was found that the result of operation was successful in four cases and unsuccessful in one case (the atrophy case).

Three patients had a normal range of active shoulder motion, one patient had 20° restriction of elevation but otherwise free mobility. One patient's condition was unchanged from the pre-operative status, i.e., the arm could only be lifted forward-upward and outward-upward to 10° below horizontal level.

The lifting ability of the horizontal arm was measured with an ergometer and the result compared with the healthy arm. In the four successful cases this examination produced an average value of 7/10 when measuring forward-upward and 8/10 when measuring outward-upward.

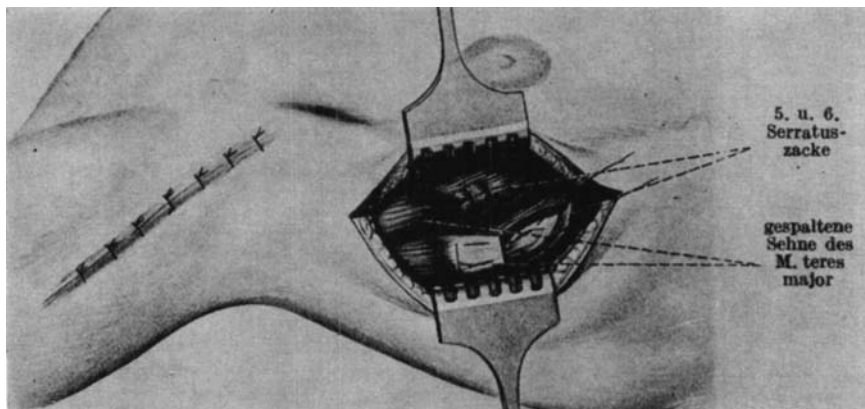


Fig. 3.

Subperiosteal attachment of the Teres major to the 5th and 6th ribs.

The unsuccessful case had bilateral pareses, so that the value from the healthy arm could not be obtained.

Normal scapular rotation was present in all cases except 1.

The tranposed muscle could be clearly palpated in three cases.

In the unsuccessful case scapula alata was still present at rest, while in the other four cases only insignificant winged scapula was seen, and then only when the elevated arm bore weight.

No restriction of mobility could be observed in the elbow, wrist, or fingers, nor did neurological disturbances arise after operation.

The true strength of the hand on the operative side measured with a dynamometer was somewhat reduced and on average was 9/10 of that on the healthy side.

The cause of the failure in the case with muscle atrophy may partly have been atrophy in the tranposed muscle; partly its coming loose from the site of implantation.

Before operative measures are taken, conservative treatment should be tried for at least $\frac{1}{2}$ -1 year, when the possibility of reinnervation exists. EMG examination may be a guide.

CONCLUSION

Transposition of the Teres major muscle according to Hass, gives very good results in suitable cases of paralysis of the Serratus anterior muscle, and the operation is relatively simple to perform.

SUMMARY

The series comprises five cases with paralysis of the Serratus anterior muscle, treated by tranposition of the Teres major according to Hass.

The etiology in three cases was trauma, in one case spinal neurogenous muscle atrophy and in one case it was unknown.

After operation four patients regained normal or almost normal shoulder function, while one patient, the atrophy case, remained unchanged.

RESUME

5 cas de paralysie du muscle serratus lateralis opérés par transposition du muscle teres major par la méthode Hass.

L'étiologie de la parésie était un trauma dans trois cas, une atrophie musculaire spinale ou neurogène dans un cas, inconnue dans le dernier cas. Après l'opération, les quatre malades avaient retrouvé une fonction normale ou presque normale de l'épaule, alors que l'état du malade était resté inchangé.

ZUSAMMENFASSUNG

Das Krankengut umfasst fünf Fälle von Lähmung des M.serratus lateralis, die mittels Transposition des M.teres major nach Hass operiert wurden. Die Äthiologie der Lähmung war in drei Fällen ein Trauma, in einem Falle spinale oder neurogene Muskelatrophie und in einem Falle unbekannt.

Nach der Operation haben vier Patienten normale oder beinahe normale Schulterfunktion wiedererhalten, während der Zustand eines Patienten unverändert ist.

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