Spinal Accessory to Suprascapular nerve transfer

This surgery involves transferring the distal branches of a functioning Spinal Accessory nerve to the Suprascapular nerve (supplying the posterior rotator cuff muscles - Supraspinatus and Infraspinatus). The branches that innervate the middle or lower trapezius are usually used. The aim of surgery is to re-innervate the shoulder external rotation muscles to 1) allow the glenohumeral joint to stay approximated and 2) allow the arm to be externally rotated and used functionally (in a neutral position). This movement will initially be instigated by a coupled movement of scapular upward rotation (elevation and retraction).

**Please note:** This procedure involves a direct nerve repair very close to the muscle. It may take up to 6 months to see a flicker of activity within the posterior cuff muscles. With any nerve transfer surgery activation of the intended muscle is variable and often unique to the individual patient. Consequently, a definitive timescale of recovery is not possible to predict. This protocol therefore follows a phased format; whereby a patient is to be progressed to the next level once they reach the relevant milestone. Common complications and their suggested management strategies are outlined below.

This is a guideline of rehabilitation for physiotherapists; any limitations and restrictions recorded in the patients’ operation note should take precedence. These guidelines should be used in conjunction with your assessment of the patient. Your treatment should be clinically reasoned and adapted to the individual patient’s needs. Time frames are approximate; progress as clinically indicated, only moving onto the next phase once the patient can comfortably achieve phase appropriate exercises and tasks, unless the operation note specifies otherwise. The exercises offer ideas rather than being a prescription.

**Telephone numbers:**
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- Secretaries: Mr Fox: 0208 909 5331
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<table>
<thead>
<tr>
<th>Possible complications:</th>
<th>Symptoms:</th>
<th>Action:</th>
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<tbody>
<tr>
<td>Neuropathic pain</td>
<td>Pain felt in the shoulder forearm or hand; burning stinging or shooting in nature.</td>
<td>Ensure regular analgesia is being taken (Paracetamol) to distinguish between post operative pain. Contact RNOH CNS, surgical team +/- GP.</td>
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<tr>
<td>Numbness in the arm or hand</td>
<td>Tingling or lack of feeling in the shoulder, arm or hand which is not painful.</td>
<td>Discuss with RNOH surgical team +/- therapy team at next routine appointment</td>
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<tr>
<td>Failure to progress through phases</td>
<td>Lack of palpable or visible supra and infraspinatus muscle contraction at 6 months post op. Failure to increase strength of posterior cuff despite strengthening programme. Poor motivation to continue with rehabilitation.</td>
<td>Discuss with RNOH surgical team +/- therapy team at next routine appointment. Ensure that patient has an understanding of the slow nature of recovery in order to keep their motivation to rehabilitate.</td>
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<tr>
<td>Co-contraction</td>
<td>Activation of both agonist and antagonist muscle groups (e.g. Latissimus Dorsi and Pecs) preventing movement through range. Abnormal movement patterning.</td>
<td>Discuss with RNOH surgical team +/- therapy team at next routine appointment</td>
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<tr>
<td>Scar adhesions/tethering</td>
<td>Tight cord or band of scar tissue. Overgrowth of scar beyond normal boundaries. Skin adhered to deeper layers of tissue noticeable of palpation of scar site.</td>
<td>Reinforce scar massage and ensure good technique. Consider other treatment modalities such as silicone gels. Discuss with RNOH therapy team if needed.</td>
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<tr>
<td>Phase 1: PROTECTION</td>
<td>Phase 2: MUSCLE ACTIVATION</td>
<td>Phase 3: PROGRESS LOADING and NORMAL MOVEMENT</td>
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<tr>
<td>Milestone: 0-6 weeks</td>
<td>Milestone: 6 weeks onwards</td>
<td>Milestone: Grade 3 muscle activation in Biceps</td>
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**Advice**

- Lancaster sling 6/52.
- Strip wash with the use of Collar and Cuff and use wipe for axilla hygiene.
- Scar management can begin at 2/52 after wound check.
- Encourage good posture.
- Keep as active as possible e.g. walking, recumbent bike.

**Advice**

- Wean off sling – starting in the home. Could try 1 hour on/off. Decrease as comfort allows.
- May consider shoulder subluxation support – such as an “omotrain®”.
- Pace activities throughout day.
- Encourage good posture with an emphasis on normal movement.
- Continue scar management programme.
- May return to work.
- The individual may return to driving when they decide that they are safe to do so. May need DSA assessment.
- If patient showing signs of psychological trauma please consider referral to local psychology/talking therapies team.
- Progress gym activities as appropriate e.g. cross trainer, running, and squats.

**Exercises (SHOULD NOT EXACERBATE PAIN)**

- No Gleno-humeral joint movement
- No AROM or PROM of elbow or forearm (if has had concomitant Oberlin nerve transfer).
- Maintain AROM and PROM wrist and hand.

**Exercises (SHOULD NOT EXACERBATE PAIN)**

- Start full PROM programme.
- Begin donor muscle activation programme of coupled movement – scapular upward rotation – elevation and retraction with (passive) GHJ external rotation.
- Integrate HEP into functional activities e.g. placing hand on mouse when using computer.
- Strengthen innovated muscles (if clinically appropriate).
- Once Grade 1 muscle activation seen in cuff consider Electrical stimulation +/- biofeedback to assist muscle activation.
- Consider gravity neutral positions to encourage active ER at first signs of re-innervation (e.g. slides on table top).
- Consider water based exercises.

**Exercises**

- Continue to focus on active functional movements such as reach to side, lifting in arm neutral, hand to mouth and to back of head.
- Begin light resistance exercises as appropriate (related to the patient’s level of muscle activation).
- Attempt to retrain muscle patterning if required.

Therapists who are not experienced in treating patients who have undergone nerve transfer surgery may find the following references useful:

- Sturma et al. (2019) Structured Motor Rehabilitation after selected nerve transfers. Journal of Visualized Experiments e59840
- [https://www.rnoh.nhs.uk/services/rehabilitation-guidelines](https://www.rnoh.nhs.uk/services/rehabilitation-guidelines)

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