NATIONAL INSTITUTE FOR HEALTH AND CARE EXCELLENCE

Interventional procedures consultation document

Free-functioning gracilis transfer to restore upper limb function in brachial plexus injury

The brachial plexus is a network of nerves coming from the neck and supplying muscles in the arm. Damage to these nerves can cause muscle paralysis, which stops the arm working properly. This procedure is done under general anaesthesia, a piece of hamstring muscle and its nerve and blood supply (free-functioning gracilis) are taken from the inner thigh, transferred to the arm and joined to the damaged nerve. The aim is to restore arm function, usually bending the elbow. Long-term physiotherapy is needed.

NICE is looking at free-functioning gracilis transfer to restore upper limb function in brachial plexus injury.

NICE's interventional procedures advisory committee met to consider the evidence and the opinions of professional experts, who are consultants with knowledge of the procedure.

This document contains the draft guidance for consultation. Your views are welcome, particularly:

- comments on the draft recommendations
- information about factual inaccuracies
- additional relevant evidence, with references if possible.

NICE is committed to promoting equality of opportunity, eliminating unlawful discrimination and fostering good relations between people with particular protected characteristics and others.

This is not NICE's final guidance on this procedure. The draft guidance may change after this consultation.

After consultation ends, the committee will:

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- meet again to consider the consultation comments, review the evidence and make appropriate changes to the draft guidance
- prepare a second draft, which will go through a resolution process before the final guidance is agreed.

Please note that we reserve the right to summarise and edit comments received during consultation or not to publish them at all if, in the reasonable opinion of NICE, there are a lot of comments or if publishing the comments would be unlawful or otherwise inappropriate.

Closing date for comments: 25 September 2020

Target date for publication of guidance: February 2021

1 Draft recommendations

1.1 Evidence on the safety of free-functioning gracilis transfer to restore upper limb function in brachial plexus injury shows well-recognised complications. Evidence on its efficacy is adequate to support the use of this procedure provided that standard arrangements are in place for clinical governance, consent and audit. Find out what standard arrangements mean on the NICE website.

1.2 This procedure should only be done in a specialist brachial plexus unit by a multidisciplinary team, with input from microvascular surgeons.

2 The condition, current treatments and procedure

The condition

2.1 The brachial plexus is a network of nerves that carries signals from the spinal cord to the shoulder, arm and hand. These nerves can be damaged by being stretched, compressed or torn from the

spinal cord. The most severe brachial plexus injuries are often a result of road traffic accidents. Severe nerve damage can lead to paralysis of an upper limb, with a loss of function and sensation, and severe pain.

Current treatments

2.2 Treatment depends on the type and severity of the injury, and the length of time since the injury. Injuries of the upper brachial plexus roots affect the muscles around the shoulder and injuries of the lower roots affect the hand. Many injuries affect both upper and lower roots. Current treatments include drugs to treat pain, and conservative care (such as physiotherapy). For some people surgical procedures (such as direct suture, nerve grafts, nerve transfer, tendon transfer and free-functioning muscle transfer) are needed to restore function.

The procedure

2.3 This procedure aims to restore the function of the upper limb after brachial plexus injury, improving the patient's ability to carry out daily activities.

2.4 The procedure is performed under general anaesthesia, with the patient in a supine position. A functioning gracilis muscle, with its own nerve and blood supply, is dissected from the inner thigh. The gracilis muscle is then transferred and joined to the prepared recipient site of the upper limb, and the gracilis muscle's nerve is connected to a functioning nerve in the arm. The transfer is usually to 1 muscle group but transfer to different sites, such as the biceps or the finger flexors, may be needed depending on the nerve injury.

2.5 After the procedure, the patient needs to wear a cast or splint for about 6 weeks to immobilise the elbow and protect the transferred

gracilis muscle. Then long-term physiotherapy is needed so that the patient can learn to control the transferred muscle.

3 Committee considerations

The evidence

3.1 NICE did a rapid review of the published literature on the efficacy and safety of this procedure. This comprised a comprehensive literature search and detailed review of the evidence from 9 sources, which was discussed by the committee. The evidence included 2 systematic reviews, 4 non-randomised comparative studies and 3 case series. It is presented in table 2 of the interventional procedures overview. Other relevant literature is in the appendix of the overview.

3.2 The professional experts and the committee considered the key efficacy outcomes to be: restoring upper limb function and improving quality of life.

3.3 The professional experts and the committee considered the key safety outcomes to be: pain, bleeding, infection and graft failure.

3.4 Patient commentary was sought but none was received.

Committee comments

3.5 The committee noted that this procedure can be done as a single or double free-functioning gracilis transfer and evidence suggests a double transfer may be more effective than a single transfer.

3.6 The committee noted that postoperative physiotherapy is essential for functional recovery and relearning neurological muscle control. The exact type of physiotherapy has not been determined but long-term supervision from physiotherapists is needed and patients must be completely engaged with their therapy.

3.7 The committee was informed that after the procedure it takes approximately 4 months for nerve reconnection and up to 1 year for muscle movement.

3.8 The committee noted that severe brachial plexus injuries can have a considerable adverse effect on a person's ability to carry out daily activities and quality of life.

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Chair, interventional procedures advisory committee
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