

# Study finds long nerve grafts restore function in patients with brachial plexus injury

March 22 2013

---



"Conventional wisdom is that grafts longer than seven centimeters (about three inches) don't work well. We set out to test this theory and found that long nerve grafts did work well. Our study concludes that this type of graft should not be overlooked as an effective treatment for an axillary nerve injury," said Dr. Scott W. Wolfe, lead author and director of the Center for Brachial Plexus and Traumatic Nerve Injury at Hospital for Special Surgery in New York City. Credit: Hospital for Special Surgery

A study by researchers at Hospital for Special Surgery (HSS) challenges a widely held belief that long nerve grafts do poorly in adults with an axillary nerve injury. Investigators found that the outcomes of long nerve grafts were comparable to those of modern nerve transfers. Both procedures restored function. The axillary nerve supplies the deltoid muscle of the shoulder and an important rotator cuff muscle. It's part of the brachial plexus, a network of nerves that runs down from the neck and across the shoulder.

"[Conventional wisdom](#) is that grafts longer than seven centimeters (about three inches) don't work well. We set out to test this theory and found that long [nerve](#) grafts did work well. Our study concludes that this type of graft should not be overlooked as an effective treatment for an axillary nerve injury," said Dr. Scott W. Wolfe, lead author and director of the Center for Brachial Plexus and Traumatic Nerve Injury at Hospital for Special Surgery in New York City.

The study, titled, "Comparison between Long Nerve Grafts and Nerve Transfers for Axillary Nerve Injuries," will be presented at the annual meeting of the American Academy of Orthopaedic Surgeons on March 22 in Chicago.

Injury to the brachial plexus can be devastating, leaving people unable to use their arms or hands. The most common cause is a [motor vehicle accident](#) or [sports injury](#). The Center for Brachial Plexus and Traumatic Nerve Injury at Hospital for Special Surgery offers advanced diagnostic and [treatment options](#), including complex nerve reconstruction surgery.

Nerve reconstruction is considered when nerves are so severely damaged they cannot recover on their own. These complex operations can take up to 12 hours. Surgeons reconstruct nerves either by bridging a nerve

defect with a nerve graft or by performing a nerve transfer from a nearby healthy nerve to share its function. In the study, researchers compared these two different techniques to reactivate the deltoid muscle and enable patients to regain the use of their arm.

"A nerve transfer takes a working nerve from one muscle and transfers all or part of that nerve to a non-working nerve or another muscle, so that the two muscles can share the nerve and regain function," Dr. Wolfe explained. "A nerve graft involves taking a nerve from another part of the body. The nerve is removed from a location where its function is less important, usually the leg, and moved to the damaged area. It is used to bridge the defective gap between two ends of a nerve to restore function."

Only 150 to 200 highly specialized surgeons worldwide perform these complex brachial plexus surgeries, and Dr. Wolfe and his colleagues aim to raise awareness that the procedures can restore function in people severely debilitated by a nerve injury. It is important for patients to be treated in a timely manner.

Traditionally, nerve grafts longer than seven centimeters have demonstrated worse outcomes than short grafts and poorer functional outcome when compared to nerve transfer surgery. The purpose of the HSS study was to take another look at longer grafts and directly compare the outcomes to nerve transfers. The results were measured by the patients' recovery and by a test called electromyography, or EMG. This sophisticated test is used to objectively measure muscle and nerve function.

In the study, 11 patients treated with long nerve grafts (> 7cm, range 9cm to 15cm) were compared with 14 patients treated by a nerve transfer over a 10-year period. The average length of the nerve graft was 13cm (5.2 inches). Data was collected at regular intervals, beginning pre-

operatively and continuing for up to 11 years.

Prior to surgery, all patients had EMG tests that showed complete absence of deltoid muscle function. After surgery, deltoid recovery, range of motion and EMG evidence of restored function were compared.

The study found no statistically significant differences in shoulder strength, range of motion or electromyographic recovery between nerve graft and nerve transfer patients. All adults in the long nerve graft group regained at least enough strength to be able to move their arm against gravity, but there were two failures in the nerve transfer group. "Going from no function with a limp and numb arm to gaining enough strength to be able to lift a glass to one's lips is a major gain for these patients," said Dr. Wolfe, who is also chief emeritus of the Hand and Upper Extremity Service at HSS. .

"Improvements in the patients receiving a nerve graft were identical to improvements in the nerve transfer group," he added, "so now surgeons can say with confidence that 'a long [graft](#) has a good chance of working,' instead of abandoning the procedure when a nerve transfer is not an option."

Unfortunately, some patients suffer long-term impairment from nerve injuries that could have been repaired because many physicians are unaware that nerve reconstructive surgery works, according to Dr. Steve K. Lee, director of research at the Center for Brachial Plexus and Traumatic [Nerve Injury](#). "When a nerve that controls a muscle loses function, it needs to be reactivated within about 12 months, before the muscle atrophies. Studies have shown that if nerve [reconstruction surgery](#) is done within six months after a nerve is damaged, patients do much better."

Dr. Joseph Feinberg, who is co-medical director of the Center and

performs diagnostic testing to evaluate nerve injuries, says studies such as the one conducted at HSS are important to raise awareness. "In general, many people feel that these types of nerve injuries are permanent and not many treatments are effective. We want people to be aware that they do have options. Procedures can be done to restore function, even when a patient has completely lost the ability to use certain muscle groups," said Dr. Feinberg, who is physiatrist-in-chief at Hospital for Special Surgery.

Dr. Wolfe says the next step will be to conduct a rigorous multi-center study to better define the role of nerve grafts versus nerve transfers and how best to use the two techniques.

Other contributing authors from Hospital for Special Surgery are Parker Johnsen, B.S., who is the presenting author, and Adele Mirbey, B.A.

**More information:** Paper: Comparison between Long Nerve Grafts and Nerve Transfers for Axillary Nerve Injuries, (Paper 801)  
Friday, March 22, 2013, 4:36 p.m. – 4:42 p.m. CDT. McCormick Place, Room N426.

Provided by Hospital for Special Surgery

Citation: Study finds long nerve grafts restore function in patients with brachial plexus injury (2013, March 22) retrieved 18 April 2024 from <https://medicalxpress.com/news/2013-03-nerve-grafts-function-patients-brachial.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--