



Tendon Transfers

Tendon transfers surgically reroute arm muscles to restore hand function in people with paralysis. The basic techniques date back to the 19th century; in the past 50 years tendon transfers have been refined and are commonly done. But according to a newly published paper in the journal *Spinal Cord*, many potential beneficiaries of this procedure don't even hear about it as an option.

The paper, "Acceptable benefits and risks associated with surgically improving arm function in individuals living with cervical spinal cord injury" comes from a team led by Kim Anderson, Ph.D., of the Reeve-Irvine Research Center in Irvine, CA. She worked with Swedish hand surgeon Jan Frieden and San Diego based muscle physiologist Richard L. Lieber.

The study grew out of an earlier survey from Anderson that indicated that people with cervical injuries place restoration of hand function as their primary concern – well ahead of bowel, bladder or even sexual function. Tendon transfers typically allow a quad with no hand function to extend the elbow and form a grip – enormously useful in dressing, eating, transferring and even handwriting.

Anderson, who herself lives with a cervical injury and has limited hand function, cites research that only 14 percent of qualified candidates actually received such treatment. She wondered why – is it fear of surgery? "It turns out this is not because people are choosing not to have the procedure; it's because they are not aware of the procedure," says Anderson.

In other research Anderson cites, those who got tendon transfers are happy with them; 77 percent said they would have the surgery again.

When she was injured 20 years ago, says Anderson, she was a good candidate for tendon transfer surgery. Nobody told her about it, even at a major Model Systems SCI center. Because the procedure requires a period of immobilization and later, rehab, as the surgery heals, Anderson is reluctant to have it done now. "If I had known in the first couple of years after my injury, I probably would have had it done. Now it would interfere with work and my daily activities, such as driving."

According to Anderson's recent survey, time and rehab are not limiting factors for the quads she contacted. She reports that 80 percent of those surveyed would be willing to spend two or three months being less independent for the chance to become much more independent. "That is what this is about," says Anderson, "being able to do things on our own without having to be so dependent on other people."

Here is the basic idea behind tendon transfers, from the American Society for Surgery of the Hand:

Below the elbow, there are over 40 muscles, each with a different function. For example, there are nine muscles that move the thumb. Each muscle tapers down into a tendon that then attaches onto bone in a specific place; when the muscle fires (contracts), it causes a certain motion.

During tendon transfer surgery, the muscle is left in place; the nerve supply and blood supply to the muscle are left in place. The tendon insertion onto bone is detached and re-sewn into a different place. It can be sewn into a different bone, or it can be sewn into a different tendon. Now, when the muscle fires, it will produce a different action, depending on where it has been inserted.

Anderson suggests an education campaign so doctors who don't see SCI routinely become more aware of tendon transfer surgery. Adding this to the curriculum at medical school is one possibility.

If you think you may be a candidate for a tendon transfer, Anderson suggests asking around until you find a surgeon who has done the procedure in other quads. She is hoping to compile such a list. Meanwhile, the American Society for Surgery of the Hand website <http://www.assh.org/> offers a specialist referral service.

Source: Sam Maddox, *Spinal Cord* (2009) 47, 334–338

Websites

http://orthoinfo.aaos.org/topic.cfm?topic=A00371&return_link=0

American Academy of Orthopaedic Surgeons: Restoring Hand Function After Spinal Cord Injury

<http://emedicine.medscape.com/article/1286712-overview>

eMedicine: Hand, Tendon Transfers

http://www.sci-illinois.org/surgery_hand_function

Spinal Cord Injury Association of Illinois: Tendon Transfer Surgery to Restore Hand Function

<http://www.assh.org/Public/HandConditions/Pages/TendonTransferSurgery.aspx>

American Society for Surgery of the Hand: Tendon Transfer Surgery

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