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Cervical neurotomy for post-stroke aphasia

Functional improvements seen after golden period of stroke recovery

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The recovery journey after stroke often plateaus after the initial “golden period” of about 3-6 months, with further substantial functional improvements typically limited.^{1,2} Aphasia, a language impairment resulting from damage to the brain’s language centres, leaves many patients with few treatment options beyond this window, and they are often stigmatized as non-responders to standard interventions.^{3,4} A linked randomised controlled trial by Feng and colleagues (doi:10.1136/bmj-2024-083605) tackled this challenge.⁵ The study investigated the adjunctive role of right neurotomy of the seventh cervical nerve (C7) combined with intensive speech and language therapy (SLT), building on previous research by the same research group.^{6,7} C7 neurotomy involves a surgical intervention targeting the C7 nerve root at the right intervertebral foramen. Although C7 neurotomy is typically used to treat spasticity of the left arm, Feng and colleagues propose it as a novel treatment for chronic aphasia after stroke.

The trial, conducted in China, involved 50 people with chronic aphasia (>1 year) after a single left hemispheric stroke, who were randomised to receive either C7 neurotomy plus three weeks of intensive SLT or three weeks of intensive SLT alone (control group). The primary outcome was change in the 60 item Boston naming test score from baseline to three days, one month, and six months after intervention. Secondary outcomes included broader language function (Western aphasia battery-aphasia quotient), patient reported quality of life (Barthel index), and measures of post-stroke depression. The neurotomy plus intensive SLT group showed statistically significant improvements across all measured outcomes compared with the control group.

For patients in the chronic phase of stroke recovery with spasticity in the right upper arm and co-existing aphasia, this study seems to offer a glimmer of hope. It suggests a potential for further recovery exceeding the golden period.

Some caution is, however, warranted. Firstly, despite C7 neurotomy’s association with improvements in motor function and reduced spasticity in patients with spastic arm paralysis due to cerebral injury,^{8,9} it is a surgical procedure that should not be considered as a first line treatment for acute or subacute stroke, even for treating spasticity. This is primarily because during these earlier stages, the potential for spontaneous motor recovery is considerable, and a range of less invasive, multimodal treatments are available to promote rehabilitation.¹⁰ These include physiotherapies, occupational therapies, drugs, and botulinum toxin injections. Surgical interventions such as NC7 neurotomy are typically reserved for chronic,

established spasticity when these conservative measures have been exhausted or are deemed insufficient. This is especially true when the potential for spontaneous motor recovery in the affected arm exists, as C7 neurotomy is mostly used in people with spasticity for more than one year, and the procedure may induce muscle weakness, sensory loss, and pain in the arm.¹⁰⁻¹²

Secondly, the highly specific inclusion criteria of this trial—chronic phase, left hemispheric stroke, aphasia with co-existing spasticity of the right arm—mean that the results apply to a select subgroup of people after stroke. Generalisation beyond this profile requires further research. Lastly, further studies with larger sample sizes, diverse settings, different investigator groups, and long term data on efficacy and safety in real world populations are needed. Replicating these findings in different languages and contexts would be a useful next step. Further studies, including animal and neuroimaging studies, could also explore the possible mechanisms of how the peripheral neurotomy influences cortical reorganisation and language networks. Feng and colleagues’ findings also raise the question of whether C7 neurotomy could help with other stroke related impairments beyond aphasia and spasticity.

In conclusion, Feng and colleagues’ trial is an interesting step forward with room to explore further, suggesting that C7 neurotomy, when combined with intensive SLT, may offer benefits for certain people with chronic aphasia after stroke in whom improvement from treatment was previously thought to be limited. The concept of the golden period often leads to healthcare policies that restrict funding or access to intensive rehabilitation services, including intensive SLT, for people with chronic stroke. This often results in persistent disabilities such as severe communication impairments (eg, chronic aphasia), functional limitations, reduced quality of life, and increased caregiver burden, representing important long term sequelae after stroke.¹³⁻¹⁵ If further evidence supports these findings, there could be a possible reason to rethink funding or reimbursement for people with chronic stroke who meet the appropriate criteria.

Although intensive SLT remains the cornerstone of aphasia treatment,¹⁶ C7 neurotomy could become a potential adjunctive option for carefully selected individuals in the future. This research should spark further scientific research and a critical re-evaluation of rehabilitation paradigms and policies for chronic stroke care, fostering a more optimistic and proactive approach to long term recovery.

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