CASE REPORT
Trapezius Palsy Resulting from Accessory Nerve Injury after Cervical Lymph Node Biopsy Dramatically Improved with Conservative Treatment

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Background: Iatrogenic injuries to the spinal accessory nerve (SAN) are not uncommon during cervical lymph node biopsy. Many operative treatments for SAN injury in the posterior cervical triangle have been reported, but there are no guidelines regarding the choice between operative and nonoperative treatments. Because it is believed that the nerve seldom spontaneously regenerates, some articles suggest surgical intervention within 3 months from the nerve injury to achieve good postoperative results. However, we experienced a case of spontaneous accessory nerve recovery more than 3 months after accessory nerve injury. It is necessary to carefully exclude similar patients from unnecessary surgery. Case: A 41-year-old woman underwent cervical lymph node biopsy at an otolaryngology clinic. She experienced pain across her neck and weakness of the shoulder in abduction just after the biopsy. Three months after the biopsy, her symptoms persisted and she was referred to our hospital for surgical treatment. On careful examination, we detected signs of accessory nerve regeneration. Consequently, we prescribed physical therapy and a rehabilitation program, including active and passive range-of-motion exercises of the shoulder and muscle strengthening exercises. Six months after the injury, there was a dramatic improvement of the trapezius muscle function and the patient became pain free. Discussion: When the biopsy incision is more than one finger’s breadth away from the normal course of the SAN, and when Tinel-like signs advance along the trapezius muscle over time, spontaneous SAN recovery can be anticipated.

Key Words: accessory nerve injury; cervical lymph node biopsy; conservative treatment
achieve recovery of the muscle. We have experienced cases in which spontaneous nerve recovery occurred only with physical rehabilitation therapy. The aim of this article is to show how to predict spontaneous SAN recovery based on the report of such a case.

CASE

A 41-year-old woman with no previous significant medical record noticed swelling of her cervical lymph node and had it biopsied under local anesthesia at an otolaryngology clinic. Informed consent for this case report was obtained from the patient. The biopsy specimen turned out to be benign, and the patient did not undertake additional treatment such as surgery or radiation therapy. During the biopsy procedure, the patient experienced snapping and involuntary movement of the arm. For 2 months, the patient complained of neck pain, weakness of the shoulder in abduction, and drooping of the shoulder and was subsequently referred to another orthopedic clinic. There the patient was diagnosed with SAN injury and was prescribed mecobalamin; she was referred to our hospital for surgical intervention 3 months after the injury. On admission, she had winging of the scapula in abduction, a deep subclavian triangle, and difficulty in abducting the arm horizontally. The range of shoulder abduction was 0°–90° and the muscular strength of the shoulder was fair. Taken together, these symptoms suggested injury of the SAN (Fig. 1). On close examination, we noted that the biopsy incision was not directly over the SAN, and the Tinel-like sign was not under the wound but was over the upper third of the trapezius muscle. Moreover, the patient could squeeze her shoulder, which suggested that the upper third of the trapezius muscle was intact (Fig. 2). These findings indicated that the SAN had suffered axonotmesis but not neurotmesis. Consequently, the nerve could recover through the superior angle of the scapula to the lower fibers of the trapezius. We treated the patient with physical therapy and a rehabilitation program consisting of passive and active range-of-motion exercises of the shoulder and neck and strengthening exercises for the shoulder abductor muscles. We also continued prescribing mecobalamin. The patient was followed up every month and showed advancement of the extent of the Tinel-like sign. Six months after the SAN injury, the patient experienced dramatic improvement of the trapezius muscle function and became pain free (Fig. 3).

DISCUSSION

Cervical lymph node biopsy is the most common cause of iatrogenic SAN injury, with an incidence of 3%–10%. The SAN ascends through the jugular foramen, descends into the neck intimately related to the internal jugular vein, passes deep into the sternocleidomastoid muscle, emerges on the posterior border of the muscle, passes almost vertically across the floor of the posterior triangle and over the levator scapulae, and becomes embedded in the deep cervical
Because cervical lymph nodes often immediately abut the SAN, a detailed knowledge of posterior neck anatomy, judicious use of bipolar cautery, and magnifying loupes are recommended for biopsy.

Many operative treatments for accessory nerve injury in the posterior cervical triangle have been reported, but there are no guidelines for the selection of operative or conservative treatment. Electromyography (EMG) of the trapezius is helpful in assessing the function of the nerve; however, atrophic trapezius is so thin that the electrode can erroneously detect activity in the underlying levator scapulae, serratus anterior, or rhomboid muscles. Moreover, the upper third of the trapezius may receive a contribution from the cervical plexus that blurs EMG diagnosis.

SAN injury is associated with many signs and symptoms, but the etiology of neck and shoulder pain is not known. Some authors have reported that trapezius palsy and traction of the arm itself may cause the pain associated with SAN injury, or that neuropathy or injury of the associated sensory nerve causes the pain. The SAN is a pure motor neuron, and Tinel signs occur as a result of sensory nerve injury only. Consequently, we used the term “Tinel-like sign”. In our case, a Tinel-like sign advanced along the course of the SAN, i.e., under the trapezius muscle and over the scapula from the upper third to the lower third of the trapezius muscle, so the nerve itself seemed to induce the pain.

We followed up this patient every month, but we recommend two-week follow ups for similar patients to allow detection of advancement of the Tinel-like sign. Nerve regenerates at about 1 mm per day, i.e., 10–15 mm per 2 weeks; we believe that this distance can reasonably be detected at every 2-week checkup. The distance between the current SAN injury and the upper third of the trapezius muscle was about 5 cm, so muscle recovery could be expected in 2 months at the earliest.

It is possible that improvement of the shoulder function was achieved by compensation by other muscles of the shoulder. There are only a few reports of the efficacy of conservative treatment for SAN injury. One report suggested a vigorous rehabilitation program for late-diagnosed SAN injury to achieve a gain of function in the affected extremities, but most reports suggest Eden-Lange muscle transfer because the re-educated muscles of the shoulder girdle can only partially compensate for the permanently paralyzed trapezius. In our case, no symptoms were detectable after 3 months of rehabilitation, so we assumed that the improvement was achieved by recovery of the nerve.

We have experienced cases in which spontaneous nerve recovery occurred only with active and passive range-of-motion exercises. We propose the following criteria for conservative treatment for SAN injury after cervical lymph node biopsy. The incision of the lymph node biopsy is more than one finger’s breadth away from the course of the accessory nerve. Some contraction of the upper fibers of the trapezius muscle is detected. The positive Tinel-like sign over the trapezius muscle advances noticeably in 2 weeks. In our patient, scapular winging disappearing about 2 months after the injury.

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Fig. 2. Early signs of accessory nerve regeneration: scar in the posterior cervical triangle (A), Tinel-like sign over the trapezius muscle (B), and the patient was able to squeeze her shoulder (C).
CONFLICTS OF INTEREST

The authors declare no potential conflicts of interest with respect to the research, authorship, and publication of this article.

REFERENCES


Fig. 3. Results of physical rehabilitation. A After 1 month of rehabilitation, the patient still had scapular winging, but she could abduct her arm horizontally. The Tinel-like sign was at the superomedial angle of the scapula. B After 2 months of rehabilitation, scapular winging was ameliorated and the Tinel-like sign had moved further along the path of the SAN. C, D After 3 months of rehabilitation, the patient no longer had the Tinel-like sign on her shoulder, no scapular winging was evident on abduction, and she had the full active range of motion of her arms.


