Isolated suprascapular nerve palsy following childbirth: A case study and literature review

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Abstract

We report a case of 30-year-old lady presenting with a suprascapular nerve (SSN) injury in the postpartum period. Two days following normal delivery, the patient experienced progressive weakness in her left shoulder, of spontaneous onset. Initially thought to be a rotator cuff tear, further imaging indicated a lesion in the SSN. Isolated SSN palsy is a rare occurrence. Previously reported cases of brachial plexus nerve injuries are due to trauma, traction, iatrogenic and the positioning of the patient during surgery. To our knowledge this is the first case report of SSN injury following normal delivery. In addition to the unusual presentation, our patient completely recovered from the SSN nerve injury without any operative management.

Keywords

suprascapular nerve palsy, postpartum, rotator cuff, non-operative management

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Introduction

The suprascapular nerve (SSN) provides motor innervation to the infraspinatus and supraspinatus muscles and a sensory branch to the posterosuperior shoulder.¹

The SSN originates in the brachial plexus upper trunk at Erb's point. Its course then runs posterior to the clavicle, inferior to the transverse scapular ligament, entering the suprascapular notch via the suprascapular foramen giving branches to the supraspinatus.^{1,2} The nerve then courses parallel to the scapular border, superior to the spinoglenoid notch, finally entering the infraspinatus fossa. Here, its branches innervate the infraspinatus muscle.² The SSN may be injured anywhere along this pathway. We report a case of isolated SSN palsy following normal delivery.

Case report

Two days following full-term normal delivery, a 30-year-old right-hand dominant lady developed left shoulder weakness associated with pain radiating from her shoulder to the neck and distally to her elbow joint. During the delivery, she was in stirrups with traction on her posterior thighs. She had no antecedent shoulder,

neck or viral illness leading to childbirth. However, the patient presented to the shoulder clinic 12 weeks following the childbirth with symptoms of shoulder pain and weakness.

On examining the cervical spine and left shoulder, she had a full range of neck movement with negative Spurling's test. However, she experienced brief episodes of shooting pain in the left shoulder on abrupt movement to the left. There was weakness (Medical Research Council grade III) and wasting of the infraspinatus and supraspinatus muscles, but the shoulder was non-tender. She had full range of shoulder movement except for external rotation which was limited to approximately 40 degrees. There was no other pathology noted; hence, she was treated with analgesics and shoulder physiotherapy.

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Figure 1. MRI of the left shoulder at 12 weeks postpartum showing atrophy of supraspinatus and infraspinatus with muscular oedema.

Figure 2. MRI of the left shoulder at five months postpartum showing atrophy of infraspinatus with reduced muscular oedema.

Plain radiographs of the left shoulder were unremarkable at 10 weeks postpartum. She was investigated further to image her left shoulder rotator cuff and brachial plexus. Magnetic resonance imaging (MRI) of the left shoulder at 12 weeks postpartum indicated supraspinatus and infraspinatus atrophy and the rest of the examination was normal (Figure 1).

Electromyography (EMG) of the left brachial plexus performed three months following the injury showed progressive increase in the amplitude in the infraspinatus only, suggesting recovery of the supraspinatus.

Repeat MRI of the left shoulder at five months showed some muscle atrophy of the infraspinatus and the lessening of the oedema in the muscle and rest of the rotator cuff was normal (Figure 2).

The patient reported significantly improved motor power at six-month follow-up, but early fatigue

persisted during her gym classes. She had full range of movement in the left shoulder, normal supraspinatus muscle strength but she had a subtle loss of infraspinatus (Medical Research Council grade IV+) strength in external rotation. At that stage, she was reassured and discharged to physiotherapy.

Discussion

Peripheral nerve injuries were classified into five categories by Sunderland in 1951 which has aided in clinical management and to ascertain prognosis.³ The classification ranges from a first-degree neurapraxia, a simple conduction block, to fifth-degree resulting from complete nerve transection. Second-degree injury indicates a loss of axonal and myelin continuity, exhibiting Wallerian degeneration but with preservation of the perineurium and epineurium. Often full recovery is possible without surgical intervention. This can also be the case for third-degree injuries, where there is nerve fibre disruption involving the endoneurium, even though these injuries will recover spontaneously but partially. Fourth-degree injuries involve the perineurium, and along with fifth-degree injuries will require surgical excision and re-anastomosis to enable recovery.^{3,4}

SSN injuries are commonly associated with brachial plexus injuries due to trauma or traction injuries. Isolated injury to the SSN can occur with fractures around the shoulder girdle.

Kopell and Thompson described the first case of SSN palsy in 1959, leading to subsequent recordings of this rare palsy.⁵ SSN palsy can be localised, where both the supraspinatus and infraspinatus are affected; the underlying cause is a proximal neuropathy. Conversely, a distal neuropathy results if only the infraspinatus is affected.²

Brachial plexus injuries secondary to trauma and traction due to arm positioning have been reported during prolonged surgery; a case report by Song presented a case of severe brachial plexus injury following radical prostatectomy surgery.⁶ Anaesthetic and/or surgical positioning can also pose the risk of lateral ante-brachial cutaneous neuropathy.⁷

Injury to the SSN can result from traction injury, including tension and/or massive tears in the rotator cuff muscles.⁸ This type of injury is frequently seen in athletic individuals, especially volleyball players and those undertaking repetitive overhead movements.^{2,9} Another mechanism of SSN injury is nerve compression. Compression may result from tumours and ganglion cysts.² The anterior coracoscaphal ligament can also narrow the aperture at the suprascapular foramen and is more likely when the history reveals a traumatic aetiology.^{2,10,11} Subsequent shoulder motion would then cause SSN impingement and irritation.¹¹

The presenting complaint is often a dull aching pain of insidious nature originating in the posterosuperior aspect of the shoulder.¹ SSN palsy tends to affect the infraspinatus more than the supraspinatus, with atrophy, which can actually be seen on examination of the shoulder and/or weakness of external rotation.^{1,2} Harbaugh et al. also described a case of cutaneous dysaesthesia with SSN palsy, potentially indicating a cutaneous branch of SSN.^{12,13}

The gold standard test for compressive lesions is MRI, with near 100% sensitivity.² MRI can also assess for rotator cuff integrity.¹⁴ EMG and NCS are also performed in order to assess the functionality of the SSN, with 91% accuracy in detecting nerve injury in the presence of muscle weakness.^{1,2,15} Fibrillations and sharp waves on EMG would indicate nerve damage. Meanwhile, nerve conduction studies (NCS) would show delayed conduction from Erb's point to the supraspinatus and infraspinatus muscles.¹

Depending on the aetiology, SSN palsy may initially be treated non-operatively, with a combination of physiotherapy and non-steroidal anti-inflammatory drugs.¹ An article described the cases of four people with SSN palsy who recovered completely using non-operative measures.¹⁶ Early operative management has a better outcome in terms of pain, electrodiagnostic studies and function with a compressive aetiology compared with traction.^{1,2}

In our case, we believe that injury to the SSN was a Sunderland classification first-degree nerve injury. This occurred likely secondary to left shoulder traction, by the patient holding on to the arm supports during normal delivery. Furthermore, our patient made a full recovery from left SSN injury without operative treatment.

Conclusion

Isolated SSN palsy is a rare injury, frequently affecting athletic individuals and having either a compressive or traction aetiology. That said, the incidence might increase with greater awareness of the condition. We present an interesting and first recorded case of SSN in the post-natal period, most likely due to SSN traction. SSN palsy is therefore not restricted to the aforementioned associations. This diagnosis should be considered as a possible differential of shoulder pain. A careful history should be elicited with attention to MRI and electrodiagnostic studies as investigations. Finally, the importance of non-operative treatment has once again been highlighted.

Declaration of Conflicting Interests

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Ethical Review and Patient Consent

Permission has been obtained from the patient for her information to be used in this article.

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