CASE REPORT

How safe is blood sampling? Anterior interosseus nerve injury by venepuncture

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All invasive procedures carry some degree of risk of damage to the normal structures in the proximity of the region where the procedure is performed. The risk is, however, minimal for venous cannulation. A case is reported of an injury to the anterior interosseus nerve sustained during venepuncture for routine blood sampling at the cubital fossa.

A 44 year old woman was referred to the orthopaedic outpatient clinic with a two month history of inability to flex the terminal phalanx of the thumb and index finger of her right hand (fig 1). She said that her symptoms had developed immediately after a routine blood sampling from her right cubital fossa two days after hysterectomy. Clinically she had loss of function of the flexor pollicis longus, long flexor to the index finger, and weakness of pronation. Neurological examination of the rest of that limb as well as the contralateral limb was normal. Electromyography and nerve conduction studies showed significant denervation particularly in the pronator quadratus but there was evidence of some volitional motor unit activity in both the flexor pollicis longus and pronator quadratus indicating continuity of the nerve. The results confirmed a significant anterior interosseus nerve (AIN) lesion at the right cubital fossa. Management was conservative and expectant. As there was no clinical improvement in symptomatology, the electromyography studies were repeated at 10 months after injury. The results again confirmed a severe AIN lesion with no evidence of any recovery. Magnetic resonance imaging was also performed to exclude any localised lesions in and around the nerve but this was entirely normal. She finally had spontaneous recovery at about 20 months after injury. The power in the flexor pollicis longus, pronator quadratus, and long flexor to index finger was recorded as grade 4 at the latest follow up (34 months) and she had normal function in her hand.

Figure 1 Patient's hands showing the results of AIN injury.

Summary points

- There is anatomical proximity of the neurovascular structures to superficial veins at the cubital fossa.
- This proximity can lead to injury to the anterior interosseus nerve during venepuncture at the cubital fossa.

DISCUSSION

Injury to the anterior interosseus branch of the median nerve is uncommon; however, it is a recognised complication of fractures of the lower end of the humerus and upper ends of the radius and ulna.^{1,2} The reported causes of injury to the AIN are trauma, supracondylar fracture of humerus, pregnancy, after use of a sling for dislocation of the shoulder, and acromioclavicular joint.³⁻⁵ Immobilisation of the arm with flexed elbow, especially in the pronated position, after trauma to the upper limb has been implicated to mediate the paralysis.⁶

The cubital fossa is perhaps the most common choice for venepuncture. The AIN is predisposed to injury during such procedure given the anatomy and closed proximity of the nerve and vessels at that level. To the best of our knowledge, injury to the AIN caused by venepuncture has not been reported before. Sood and Burke have, however, reported flu-like illness or venepuncture as possible predisposing factors preceding the onset of AIN paralysis in four cases, and also noted that the time to full recovery in those patients who were treated conservatively ranged from 4 to 18 months.⁶ In our patient, the first sign of recovery was noted at about 20 months after the incident and continued recovery was noted at 32 months. The clear history of injury at the time of venepuncture was helpful when making the decision to treat it expectantly.

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