AXILLARY NERVE INJURY – A CLINICAL CASE AND REVIEW OF MANAGEMENT STRATEGIES

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Introduction The axillary nerve arises from cervical roots C5 and C6 and it is a terminal branch of the brachial plexus (Figure 1a). In its anatomical course it passes along the anteroinferior portion of the subscapularis muscle before crossing posteriorly the quadrilateral space. It then divides into two major trunks responsible for nervous supply of the deltoid and teres minor muscles. Injury can occur at any anatomical site and can result from closed or penetrating trauma, repetitive microtrauma, traction, compression, neuritis, quadrilateral space syndrome or iatrogenic lesion.

Figure 1 - Brachial plexus anatomy and axillary nerve origin (a) and correlation with patient's resonance imaging (b) - red circle line represents C5 hyperintensity

Clinical Case A 55 year old physically active male (recreational cyclist), with previously known shoulder tendinopathy, developed left omalgia and decreased range of motion (ROM) following a 60 km bicycle ride. The patient presented one month following the onset, showing deltoid amyotrophy and scapular muscle weakness (Figure 2a). Clinical evaluation and image exams excluded new bone or ligament lesions from the glenohumeral joint. MRI revealed left C5 root hyperintensity (Figure 1b) suggesting a radiculitis process and EMG confirmed nerve lesion.

Figure 2 – Patient before the rehabilitation programme (a) and at re-evaluation appointment (b)

Results The patient underwent a rehabilitation programme including passive and active ROM exercises, stretching, local massage and TENS. At the re-evaluation appointment, approximately 4 months following the injury, the patient revealed major improvements (Figure 2b) by regaining deltoid muscle mass, muscular strength and ROM.

Discussion Shoulder pain and dysfunction are common causes for P&RM referral and their management entails a broad range of differential diagnosis including rotator cuff tear, impingement, tendinitis, bursitis, adhesive capsulitis, radiculopathy, osteoarthritis, but also cardiac causes (e.g. angina pectoris), vascular causes (e.g. thoracic outlet syndrome) and pulmonary causes (e.g. lung cancer). Despite being a relatively frequent cause for such symptoms, axillary nerve lesion remains underdiagnosed. In the majority of the cases, the injury is associated with blunt or penetrating trauma, which can initially dominate the physical exam and narrow the diagnostic possibilities, nonetheless it also occurs in the context of minimal or no trauma, mainly due to nerve compression (Table 1).

Table 1 - Axillary nerve injury causes and clinical management

Causes	History and physical exam	Imaging exams
Parsonage - Turner Syndrome	Pain followed by loss of motor function and amyotrophy. Recent respiratory infection may be associated	Nerve hyperintensity on MRI and decreased conduction on EMG
Glenohumeral dislocation or fracture	Injury due to traction and compression. Previous episodes. Hyperlaxity of other joints. Severe pain and reduced ROM	Radiography (AP, axillary lateral or scapular Y view). MRI.
Nerve compression	Due to bone tumours, abnormal fracture callus, axillary artery aneurysm. Insidious and systemic symptoms	CT-scan and MRI
Quadrilateral Space Syndrome	Dull pain and nondermatomal paresthesia. Possible digital ischemia	Arteriogram: artery occlusion at 60° abduction

Conclusions Axillary nerve injury should be considered in the assessment of shoulder pain and dysfunction, even in the presence of previously known shoulder pathology. Clinical history and physical examination have a pivotal role and MRI and EMG are the diagnostic gold standards. Prompt diagnosis correlates with favourable outcome and the majority of patients have an excellent prognosis with nonoperative therapy.

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