Lesson of the month

Sensory disorder of the chest as presenting symptom of lung cancer

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Abstract

Four patients with Pancoast's syndrome had burning pain in the axilla and abnormal sensation in the intercostobrachial nerve territory. The intercostobrachial nerve is the first component of the brachial plexus to be invaded by lung tumours.

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In 1924 Pancoast¹ described a series of patients complaining of pain in the shoulder and arm and affected by apical lung tumours. In 1932 he defined a syndrome characterised by pain in the arm and shoulder, atrophy of the muscles of the upper limb, Horner's syndrome and radiological evidence of rib destruction and vertebral infiltration. Moersch, Henshaw, and Wilson² added to the clinical observations with their case histories, better defining the clinical presentation of brachial plexus involvement. They also pointed out that Horner's syndrome might not be present, depending on the site of invasion by the tumour or the metastasis, and that Pancoast's syndrome was unrelated to the pathological findings and not specific to pri-

mary lung cancer. As a result of such contributions, any chest pain with a progressive association of lower brachial plexus damage is considered to be strongly indicative of neoplasia in the upper chest. Early involvement of the intercostobrachial nerve in this syndrome is demonstrated in four cases in this study, and has not been reported before.

Method

Clinical sensory examination was performed according to recommendations laid down by Lindblom³; cold and warm sensations were tested using Lindblom's rollers kept in a warm bath or in melting ice.

Temporary pain relief was obtained in patients 1, 2, and 3 through the intravenous injection of lidocaine.⁴ Quantitative thermal testing in the area of pain and on the corresponding contralateral area was carried out with a Marstock apparatus (Somedic AB, Sweden) on patients 1 and 2.⁵

Case reports

Patient 1

A 63 year old man complained of a deep ache on the right side of his dorsum, above the right scapula, together with a burning sensation on the skin of the axilla for one year (fig 1 left). Previous medical, orthopaedic and neurological examinations, and routine cervical spine and chest radiographs were normal, except for a reduction of the C4-C5 space: CT and MRI of the cervical spine confirmed degenerative changes in the C4-C5 disc. Neurological examination revealed only a mild sign of Horner's syndrome on the right side and an area of hypoaesthesia in the cutaneous territory of the right intercostobrachial nerve. Thermal testing performed on the area of hypoaesthesia confirmed increased perception thresholds for all modalities of stimuli in the centre of the area, compared with the contralateral side. The only abnormality documented by EMG-NCS examination was a mild reduction in the right median nerve motor conduction (50.0 m/s, normal value over 51.2 m/s). Routine and apical chest radiographs were normal. A CT scan of the upper right chest revealed a tumour of the pulmonary apex invading the spine at T3-T4 level (fig 1 right).

Figure 1 (left) The area of hypoaesthesia reported by patient 1; (right) CT scan of the upper chest of patient 1 illustrating a mass eroding the right side of the T3 vertebra.

Figure 2 (left) The area of hypoesthesia reported by patient 2; (right) MRI of the chest of patient 2 illustrating a mass in the apex of the right lung.

Patient 2

A 68 year old man had pain in the right shoulder and in the upper part of his back, and a burning sensation in the right axilla for eight months (fig 2 left). Neurological examination showed absent ankle reflexes and a mild hypoesthesia to all modalities of stimuli in the upper right lateral part of the chest and in the axilla. EMG-NCS abnormalities were limited to mild signs of denervation in the C5-T1 radicular territories and a mild increase in the median nerve distal motor latency (4.2 ms, normal value less than 4.0 ms). Testing documented thermal hypoesthesia in the area clinically defined. During the pain free state, induced by intravenous lidocaine injection, the area of clinical hypoesthesia shrank and it was identified as pertaining to the right intercostobrachial nerve. Apical chest radiographs and cervical spine CT showed no abnormalities. A right plexus MRI scan showed a tumour of the right pulmonary apex (fig 2 right).

Patient 3

A 64 year old man had aching in the left axilla for five months, later extending to the ulnar side of the forearm. Clinical neurological examination showed mild muscular atrophy of the left triceps and forearm muscles, mild extension weakness of the left wrist and a weak left triceps reflex. In the pain free state induced by the lidocaine test, sensory examination highlighted an area of hypoesthesia corresponding to the cutaneous territory of the left intercostobrachial nerve and the left C7 cutaneous nerve distribution. EMG revealed mild denervation in the left flexor carpi ulnaris and triceps brachii muscles.

Radiological study of the left pulmonary apex showed a mass eroding the first and second rib.

Patient 4

A 77 year old man had complained of pain in the right shoulder and axilla for two years, caused by a cancer in the lower right pulmonary lobe. The pain was not modified by radiation therapy (40 Gy). Neurological examination revealed the right pupil larger than the left; the clinical sensory examination showed hypoaesthesia to cold and tactile stimuli in the axilla and in the upper part of the dorsum and chest on the right side. EMG showed denervation in the muscles innervated by the right C7, C8, and T1 roots. The abnormalities in NCS were an increased median nerve distal motor latency (4.0 ms, normal value under 4.0 ms) and a reduced right radial nerve sensory conduction (41.0 m/s normal value over 41.2 m/s). A chest CT scan revealed a further neoplasm in the posterior apical region of the superior right lobe, invading the second thoracic vertebra.

Discussion

Pain is nearly always the presenting symptom of the brachial plexus invasion generated by an apical lung tumor.^{2,6-8} This pain commonly anticipates neurological signs and can be referred to the shoulder girdle, or to the neck, upper chest, or subscapular area; it can also be localised in the upper arm and elbow. We emphasise the need to test sensation in the intercostobrachial nerve territory. This nerve originates from the C8, T1, and T2 roots, is partly derived from the inferior trunk of the brachial plexus⁹ and is the part of the plexus most exposed to invasion by apical lung tumours. Sensory testing of the chest area can therefore be useful in patients with shoulder or chest pain of unknown cause.

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