A Puzzling and Rare Cause of Chest and Shoulder Pain: Migrated Foreign Body to the Spleen

To the Editor:

Discomfort and pain are the sensory experiences most commonly evoked from visceral organs. Many forms of visceral pain are felt in regions of the body other than the organ whose stimulation caused pain, a process termed "referred pain" by Head [1]. Referred visceral pain is often accompanied by tenderness and hyperalgesia in the somatic region of referral. This referred pain is one of the most characteristic features of visceral pain and provides a valuable clinical diagnostic tool [2]. Meller [3] stated, "It is crucial to the effective treatment of chronic and persistent pain to have a better understanding of the mechanisms that underline the different types of hyperalgesia." When the source and site of pain may be different, this phenomenon is known as referred pain [4], which is one aspect of nociception.

Common examples of referred pain are scapular pain due to biliary colic, groin pain due to renal colic, and shoulder pain due to blood or infection irritating the diaphragm.

We report on the case of a 41-year-old man, who reported a 4-month history of pain originating from the left shoulder and disseminating to the left upper chest region, especially when working and also triggered by effort. The duration of pain was measured in hours. At that time, he was admitted to the cardiology department, but pain was found not been related with cardiovascular system. A month later, the patient was admitted to the orthopedics department with similar complaints of pain and hospitalized with a diagnosis of arthritis. During hospitalization, he was treated with diclofenac sodium 100 mg/daily p.o. and chlorzoxazone 750 mg/daily p.o., and his pain reduced slightly. After medical therapy, his pain returned only in 1-week period. Afterwards, the patient was referred to the pain clinic. Patient’s medical history showed no previous surgery or life-threatening medical situation. General physical examination, and cardiovascular and neurological examinations were found normal. Manual muscle testing and deep tendon reflexes of the upper and lower extremities were normal bilaterally. Joint movements were in all directions.

Posteroanterior chest X-ray showed a blurred image under left diaphragm that brings to mind a foreign body, so an abdominal X-ray image was taken to clarify the unidentified body. Abdominal X-ray showed a clear image of the foreign body, a sewing needle. After establishing on the diagnosis, an abdominal ultrasound scan was ordered, which showed needle to be exactly 44 mm long, embedded in the parenchymal structure of the spleen. Finally, an abdominal computed tomography (CT) scan showed sewing needle’s current location in the parenchyma near the hilum of spleen (Figure 1). After locating the foreign body, patient was consulted to the General Surgery department. They decided to explore the abdomen and spleen. It became clear that removing the foreign body from spleen was impossible by laparotomy; splenectomy was chosen as the surgical procedure. Gastrointestinal tract perforation was eliminated according to the absence of peritonitis or abscess formation. Patient was monitored after surgery; his referred pain relieved after a week. On his routine checkups at first and second months after surgery, no chest or shoulder pain was observed.

Migration of an ingested sewing needle to spleen and pancreas was first reported by Brankov in 2007 [5]. To our knowledge, this case was the second one. In 1991, PB Rajesh reported Kirschner-wire migration from clavicle to spleen [6].

Many people are familiar with cardiac ischemia that produces pain in the left part of the chest and even in the left arm and hand. This is referred as cardiac pain, a sensation felt in an otherwise normal part of the body, but that it is due to a poor oxygen supply to the heart. Similar patterns of referred pain can be detected in diseases of the gut, the bladder, or the internal genital organs where the pain is felt in the abdomen, the pelvic region, or the back, with the patient not being able to locate the pain very accurately. Pain from liver and gallbladder disease are often referred to the right shoulder. The referral pattern from
Diaphragmatic irritation is mediated via the phrenic nerve that provides motor and sensory innervations to the diaphragm as well as to mediastinal and pleural tissues. The phrenic nerve is derived from C3-C5 so that pain referral to the shoulder in a C4-C5 distribution is really a segmental pain referral. Trigger points and a regional myofascial pain syndrome affecting the shoulder that looks like an impingement syndrome or frozen shoulder can occur in persons with hepatic or gallbladder disorders [7].

The reason for the "referral" of visceral pain is the lack of a dedicated sensory pathway in the brain for information concerning the internal organs. The sensory neurons from the viscera connect within the brain with sensory pathways that carry information from the skin and muscles, and the brain interprets the signals that originate from internal organs as coming from theoverlying skin or muscles. This is known as "viscerosomatic convergence," and it is thought to be the neural basis for referred visceral pain. However, recent studies using brain imaging have shown that the areas of the brain activated by painful visceral stimuli are not exactly coincidental with those turned on during somatic pain. Although viscerosomatic convergence may underlie referred pain, there are also other factors involved in the integration of sensory information from internal organs [8].

A common example of referred pain is shoulder pain due to blood or infection irritating the diaphragm. In this case, after splenectomy, the patient's pain was resolved in 1-week period. We concluded from this pattern that the inflammation and irritation effect of the sewing needle caused referred shoulder and chest pain. So, the pain was evaluated as a referred pain, which was perceived distant from its source and resulted from convergence of nerve fibers at the spinal cord. According to the anamnesis of the patient, it is suspected that the needle is ingested with foods because he had no idea how the needle has gone there.

In conclusion, perforation of the gastrointestinal tract by an ingested foreign body is uncommon when no peritonitis or abscess formation is observed as this case. The only finding may be attacks of referred pain, so detailed anamnesis; an abdominal X-ray, ultrasonography, and CT scan can be useful to establish the diagnosis. In our opinion, all pain types in the shoulder and chest region must be considered as a referred pain.

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Sincerely,

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References
5 Brankov O. Migration of an ingested foreign body (sewing needle) to the pancreas tail and spleen. Khirurgiia (Sofia) 2007;5:64–6.