CASE REPORT

Xiphoid syndrome: an uncommon occupational disorder

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Abstract

We report a case of a 45-year-old man, complaining of swelling and pain in his epigastric region for the last 3 years. According to his medical history, he had undergone various investigations and treatments for gastro-oesophageal reflux, without relief. He had had a history of chronic repeated microtraumas to his sternum during 9 years of working as a carpenter, as a result of placing wood against his anterior chest wall and pushing the former into a plank cutting machine. On examination, a tender swelling was palpable as an immobile, hard mass showing minimal protrusion under the skin on the xiphoid process. He was diagnosed as having xiphoid syndrome. We prescribed anti-inflammatory medication and advised him to avoid pressure on his anterior chest wall, especially on the sternum, while cutting wood. At follow-up, the symptoms were relieved. Xiphoid syndrome may be seen in people performing hard physical work who incur sustained pressure or friction on their anterior chest wall. The case emphasizes the importance of the occupational history as well as clinical and radiological investigation of unusual conditions as mentioned above.

Key words

Chest pain; xiphodynia; xiphoid syndrome.

Introduction

Xiphoid syndrome involves painful swelling and discomfort of the xiphoid process of the sternum [1]. Inflammation of the xiphoid process, causing xiphodynia, arises from mechanical injury to that anatomic region. The prevalence of xiphoid syndrome is not well known as there is limited literature on this rare condition. In this article, we describe a case of xiphoid syndrome, occurring as a result of an occupational injury, drawing attention to this painful condition that can be mistaken for other causes of chest and upper abdominal pain.

Case report

A 45-year-old male was referred to our clinic with swelling and pain in the xiphoid region. He complained of chest pain and discomfort when lying in the prone position or when light pressure was applied to his chest (for example, during hugging someone or taking a deep breath). Over the preceding 3 years, he had previously undergone extensive physical examination and laboratory and radiological investigations such as computerized tomography (CT) of the thorax and none of them had revealed any significant abnormality. He had used anti-inflammatory medication intermittently and yet had no complete relief. He had also undergone gastric endoscopy the previous year because of a provisional diagnosis of an ulcer as a result of pain and swelling in the epigastric region. Finally, his symptoms were attributed to gastro-oesophageal reflux and he used anti-reflux treatment for 14 months without pain relief.

On physical examination, an immobile, mass-like protrusion was palpated in the xiphoid region. The patient had a history of chronic repeated microtraumas to his sternum, as he had worked as a carpenter for 9 years. He mentioned that in his work, he placed pieces of wood against his anterior chest wall and pushed them forward into a plank cutting machine. We concluded that in using his anterior chest wall repeatedly in this way he had caused chronic damage to the xiphoid process.

He underwent routine laboratory tests with unremarkable results. Chest radiographs in two projections (posteroanterior and lateral) showed ventral deviation of the xiphoid process on the lateral view, explaining the mass-like protrusion palpated on the chest wall (Figure 1).
To exclude any bony lesion causing such symptoms, a CT scan of the thorax (Siemens Somatom Spirit, multislice CT, Erlangen, Germany) was performed and reformatted images in coronal, sagittal and axial planes were obtained. On the sagittal images, the patient had a ventrally deviated xiphoid process confirming the lateral chest X-ray findings (Figure 2). No other chest wall or upper abdominal mass was identified.

The patient was diagnosed as having the xiphoid syndrome according to the clinical and radiological findings. Non-steroidal anti-inflammatory drugs were prescribed for 2 weeks and he was advised to avoid pressure on his xiphoid process while at work. The pain was relieved and his symptoms were reduced at follow-up after 3 weeks. At 3 months of follow-up, he mentioned that he used anti-inflammatory drugs only when he felt pain in his xiphoid region and that he had stopped using his anterior chest wall at work.

Discussion

Trauma is an important factor in the aetiology of the xiphoid syndrome. Acceleration and deceleration injuries [1], blunt trauma to the chest [1], unaccustomed heavy lifting and aerobics have been known to precipitate xiphodynia [2], probably because of the muscular attachments to the xiphoid process. Cardiac or thoracic surgery also involves trauma to the chest wall, which may change the morphology of the sternum and cause xiphodynia. Enomoto et al. [3] observed that in a patient with a history of mitral valve replacement, the xiphoid process was elongated by 6 cm and protruded anteriorly, 1 year after the operation. They suggested that the xiphoid process was separated from the sternum and pulled down inferiorly by the rectus abdominis muscle and then reconnected to the sternum, so that it was elongated [3], a mechanism, which they suggested was similar to distraction osteogenesis in limb-lengthening operations [3].

Our patient had no history of any cardiac or thoracic surgery, but a history of repeated microtrauma to the sternum incurred during his work while leaning against wood and exerting force with his anterior chest wall. Microtraumas can result in stress fractures and may cause new bone formation. New bone formation may also occur as a response to an insult such as tumour, infection, certain drugs, some arthritic conditions as well as trauma [4]. According to our observations, after the patient ceased using his chest wall while cutting wood, pain relief was established by the third week of the follow-up and anti-inflammatory drugs had helped to diminish the inflammation and resulting pain.

In conclusion, an occupational history as well as thorough clinical and radiological assessment can be important for correctly diagnosing and identifying the cause of rare conditions like the xiphoid syndrome. This disorder may be seen in people performing hard physical work who use their chest wall, such as the carpenter in our case. Clinicians should be aware of this disorder and the
diagnosis should be made by exclusion after careful examination and appropriate clinical investigation.

**Key points**

- Well-known causes such as acceleration and deceleration injuries and blunt trauma, unaccustomed heavy lifting and aerobics have been known to precipitate xiphodynia, the latter two because of the muscular attachments to the xiphoid process.
- Repeated microtraumas to the bony parts of the body during heavy physical activity can result in stress fractures and resulting new bone formation.
- People performing hard physical work who use their chest wall to exert force may be predisposed to the xiphoid syndrome.

**References**


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**Conflicts of interest**

None declared.

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**Fashion victims**

As occupational health professionals, we may be fashion leaders or followers, or just people who buy and wear clothes, but we probably do not give much thought to where and how our clothes are made. And, are we aware of the hidden price for garment workers in developing countries such as Bangladesh? In April 2013, 1129 people were killed and 2500 injured when a garment factory collapsed at the Rana Plaza complex in Dhaka, Bangladesh. More than half the victims were women and some were children. This was the deadliest garment factory accident in history. A government inquiry found that the reasons for the collapse included poor construction materials, corrupt building practices, vibrating industrial equipment at the top of a commercial building and people being forced into an unsafe structure. A recent editorial in this journal highlighted the costs of cheap fashion for workers in the garment manufacturing industry [1].

On 5 September 2013, the Church of Bangladesh Group (including Anglican Alliance, Church Mission Society, Church of Scotland, Council for World Mission, Diocese of Llandaff, Methodist Church in Britain, Oxford Mission and United Society) launched a campaign calling for global justice, wage justice and living justice for Bangladeshi garment workers [2]. Consumers are urged to consider what conditions are like for people who make their clothes, and to write to retailers and suppliers to ask:

1. Does your company import clothing made in Bangladesh or other developing countries?
2. Do you set minimum workplace standards for your suppliers?
3. Do you ensure they pay their workers a fair wage?
4. Does your company support the international Accord on Fire and Building Safety?
5. What assessments have you made recently of your supply chain to ensure significant and sustained improvements in the working conditions of garment workers?

Other suggestions include:

- Writing to members of the UK and European parliaments to ask for representations to be made to the retailers selling garments made in Bangladesh, and also to the Bangladeshi Government to improve conditions for workers in the industry.
- Talking to trade bodies to put pressure on the Bangladesh Garment Manufacturers and Exporters Association and the Bangladesh Knitting Manufacturers and Exporters Association.
- Meeting the owners or managers of shops that sell clothes imported from Bangladesh.

The key points in the campaign include:

- Security for workers, protection from fire and unhygienic conditions in the factories, keeping factory gates open with guards during working hours.
- Facilities on-site for infants and babies of women garment workers and health facilities for pregnant garment workers.
- Canteen facilities for lunch and breaks, holidays, sick leave.
- An industry-wide forum to work with government to improve industry standards.

This is an international occupational health and safety issue of monumental proportions. It is also a matter of social justice. In response to acknowledging the nature and the scale of the problem, and our collective responsibility to prevent occupational morbidity and mortality in the garment manufacturing industry, here is a campaign that occupational health and safety professionals should consider supporting.

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**References**