

## CASE REPORT

# Insidious onset of xiphodynia with an idiopathic origin—a rare case report

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**Abstract**

Xiphodynia, a rare condition involving xiphoid process inflammation, is often associated with xiphoid region trauma, such as acceleration/deceleration injuries, weightlifting, or thoracic surgery-induced morphological changes. The literature remains scarce, with few reported cases. This paper presents a 62-year-old male with diabetes mellitus type 2 who presented to a clinic for an insidious onset, non-traumatic, non-radiating pain at the lower sternum/xiphoid process with an associated “lump” for over a year. The pain was exacerbated by the prone position and palpation/pressure to the area but was not crushing, burning or pleuritic. The patient denied any other symptoms to suggest the pain was cardiac, respiratory, or gastrointestinal in origin. On examination, a tender nodule was palpated over the xiphoid process without adjacent structure tenderness or associated skin changes. A sternum X-ray showed a prominent sternum surrounded by calcifications. Given the history, exam and imaging findings, the patient was diagnosed with xiphodynia. He then was prescribed topical diclofenac gel with significant pain relief at the six-month follow-up. This report presents a rare case of insidious onset xiphodynia. Only 24 cases of xiphodynia from 1955–2010 and 12 published cases were reported in the literature. Xiphodynia is a diagnosis of exclusion with drivers of pain similar to those found in the synchondrosis joint family, such as arthritis, osteochondritis/osteochondrosis, post-viral syndromes, trauma and autoimmune pathologies. Frequently, referred pain from internal organs could be mistaken for xiphodynia. After all causes of acute pathology are excluded, the treatment of xiphodynia should be directed toward the xiphisternal joint, starting with ice, rest and oral/topical analgesics, possibly accelerating stepwise to injections, radiofrequency ablation and xiphoidectomy. In conclusion, xiphodynia, presenting as insidious xiphisternal joint pain, is diagnosed after ruling out trauma, cardiopulmonary or gastrointestinal etiology. The treatment of xiphodynia is based on symptom presentation with conservative management as the first-line therapy.

**Keywords**

Xiphodynia; Inflammation; Chronic pain; Chest pain

## 1. Background

Xiphodynia, also known as xiphoid cartilage syndrome, is an infrequently encountered medical condition characterized by localized pain and tenderness of the xiphoid process. Historically, the etiology of this ailment has been attributed to inflammation surrounding the xiphoid area, although the specific underlying mechanisms remain a subject of debate [1–4]. Several known causes of the condition are associated with trauma to the region of the xiphoid process, including acceleration/deceleration injuries, weight lifting and morphological changes after thoracic surgery with sternotomy leading to muscular adhesions to the xiphoid process [3, 4]. Many publications on xiphodynia emphasized that referred pain from

internal organs could be mistaken for xiphodynia. The literature data on xiphoid syndrome is still limited. Only 24 cases of xiphodynia were reported in a study by Lipkin *et al.* [5] in 1955, and up until 2010, fewer than a dozen publications about xiphodynia had been reported [4]. Clinicians often undertake a myriad of investigations, including stress tests, to eliminate the possibility of acute coronary syndrome in patients presenting with symptoms resembling xiphodynia. Recognizing xiphodynia in the early stages of clinical assessment not only obviates the need for unnecessary interventions but also significantly reduces the strain on healthcare resources and alleviates patient distress.

The primary objective of this study is to elucidate the clinical presentation, diagnostic considerations and therapeutic

interventions in a 62-year-old male patient presenting with idiopathic insidious onset of xiphodynia. By narrating this rare case, we aim to enhance clinicians' awareness of this rare syndrome, thereby promoting prompt diagnosis and avoiding unwarranted clinical work-ups.

## 2. Case presentation

A 62-year-old male with a past medical history of diabetes mellitus type 2 and hyperlipidemia presented to the pain management clinic for non-radiating, 3/10 pain on the Numeric Rating Scale in the lower sternum/xiphoid process and swelling for more than a year before presentation. The patient's symptom was first reported to his primary care physician (PCP) approximately three months before his presentation to the pain clinic. The patient used meloxicam daily, prescribed by his PCP, to alleviate the pain for 14 days. The meloxicam helped with the pain, but the pain returned after finishing the meloxicam. The patient had difficulty characterizing the pain but denied it was crushing, burning or pleuritic. The pain was exacerbated by direct pressure over the area and the prone position. The onset was insidious as there was no history of trauma, surgery, or any other medical condition. Throughout its course, the pain continued to have the same character and severity. The patient reported an initial "lump" when the pain commenced.

On examination, an exquisitely tender nodule was noted over the xiphoid process with no associated skin changes and without signs of adjacent structure tenderness. All other aspects of the physical exam, including cardiorespiratory, gastrointestinal, and lower limb exams, were unremarkable. X-ray imaging of the sternum revealed mild soft tissue swelling anterior to the sternum and calcified costochondral junction at the rib sternum articulation (Fig. 1). A computed tomography scan of the chest without contrast was unremarkable, with no evidence of fracture of the sternum and xiphoid process. A xiphisternal ultrasound showed minimal soft tissue swelling with no mass over the xiphoid process or the surrounding soft tissue (Fig. 2). At this point, further work-up was deferred due to a shallow index of suspicion for sinister visceral or musculoskeletal etiologies. The patient was diagnosed with xiphodynia, as all other known somatic etiologies of pain were ruled out.

The patient was prescribed topical diclofenac gel to apply up to 4 grams to the xiphoid process area up to 4 times daily as needed. Injections were offered to the patient, but he deferred, electing to continue conservative management. On follow-up two months later, the patient had significant pain relief with the topical diclofenac gel.

## 3. Discussion

The etiology of the xiphodynia is enigmatic. One study proposed the mechanism of xiphodynia derived from abnormal acquired anatomy. It noted that an anterior prominence of the xiphoid process might be the driver of the pain and inflammatory response seen clinically. However, due to a limited number of patients, it was determined that Computer tomography of the chest could not definitively attribute a prominent xiphoid process to xiphodynia [1]. Otherwise, the xiphisternal

joint is structurally a synchondrosis joint that functions in a synarthrosis pattern. Given this, drivers of pain in the xiphisternal joint need to be considered similar to those in other joints in the synchondrosis family. These include arthritic, osteochondritis/osteochondrosis, post-viral syndromes, stress fractures and autoimmune pathologies, to name a few. Unique to the case described in this article is the insidious onset of the presentation of the xiphodynia. Previous cases in the literature described cases of trauma to the joint. Though a full-spectrum work-up may reveal a rare underlying cause, the risk/benefit ratio supports an ongoing, more conservative treatment approach.

Xiphodynia is a diagnosis of exclusion. After all other causes of acute pathology are ruled out, treatment should be directed toward the xiphisternal joint. Though treatment varies case by case, conservative management is the mainstay. First-line treatment includes heat and ice in combination with gentle range of motion exercises. Oral medication options for xiphodynia include nonsteroidal anti-inflammatory drugs and opioids in severe acute cases [6]. Ten patients with xiphodynia have been described in a case series where they were injected with a local anesthetic and one in which two patients were injected with a combination of local anesthetic and steroid [7–9]. A case series exists in the literature on pulsed radiofrequency ablation targeting the T4–T7 intercostal nerves that innervate the joint [10]. Surgical xiphoidectomy is an effective, surgical option for those with intractable xiphodynia [11–13].

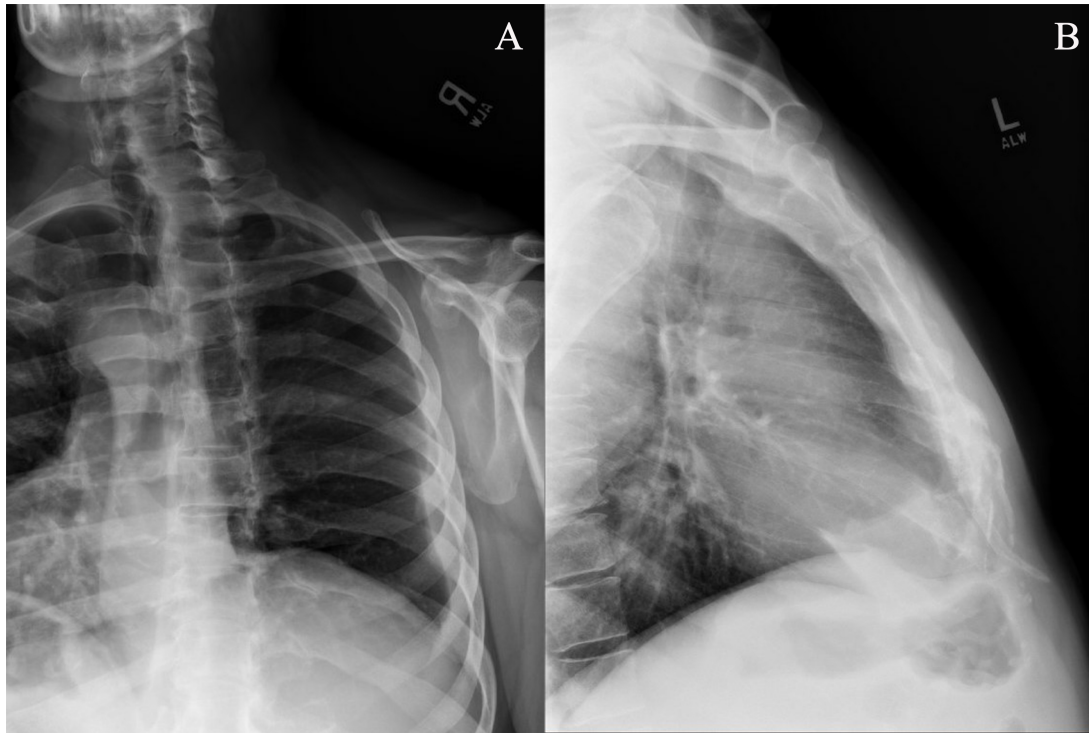
Once the diagnosis of xiphodynia is confirmed, close monitoring for exacerbation of pain should be done. A case of acute myocardial infarction exists in the literature of a patient with preceding and continuous xiphodynia symptoms that masked an active myocardial infarction [8]. Though this presentation may be extremely rare, it cautions for thoughtful management when encountering new or worsening symptomatology.

## 4. Limitations

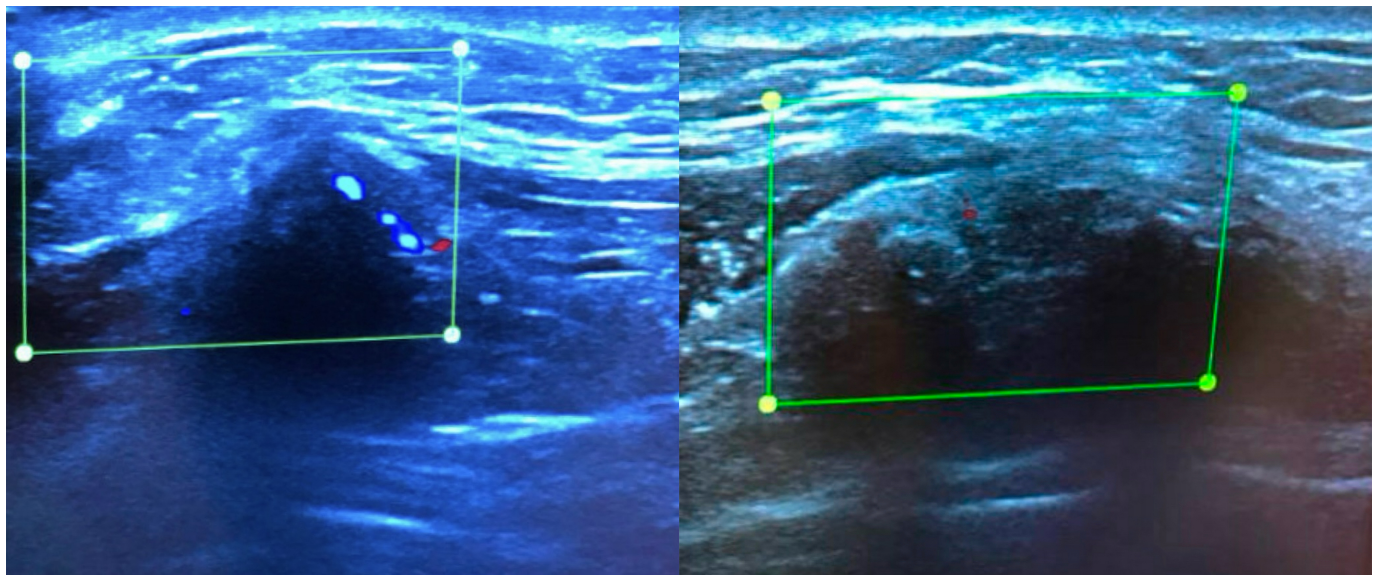
This study is inherently constrained by its design as a case report, limiting its generalizability. The limited literature about xiphodynia limited our ability to find a consistent method to treat or diagnose the condition. Large-scale studies such as systematic reviews or meta-analyses are required to derive more definitive conclusions. Furthermore, using a quality-of-life questionnaire was omitted in our evaluation, an oversight that might have provided more profound insights into the patient's subjective experiences.

## 5. Conclusion

Xiphodynia is a disease with a low prevalence with no diagnosis or management guidelines. It is usually diagnosed after ruling out serious causes of chest pain. Xiphodynia's clinical history differs from cardiac chest pain history by the absence of risk factors, lack of relationship with exertion, tenderness with palpation and a negative work-up for cardiac chest pain. The nature of the pain is similar to joint pain, with the first-line treatment being ice and gentle range of motion exercise followed by oral or topical medications. More inva-



**FIGURE 1.** Anterior-posterior (A) and lateral view (B) view of the patient's sternal X-ray revealed mild soft tissue swelling anterior to the sternum and calcified costochondral junction at the rib sternal articulation.



**FIGURE 2.** Ultrasound views of the patient's sternum showed inflammation around the sternal region.

sive interventions, such as joint injections and radiofrequency ablation, can be considered as alternatives for management, and xiphoidectomy can be the last management option, given the procedure's invasiveness. Moreover, there is a need for a standardized treatment protocol and non-invasive treatment modalities (*e.g.*, low-level laser, phonotherapy).

#### AVAILABILITY OF DATA AND MATERIALS

Not applicable.

#### AUTHOR CONTRIBUTIONS

ASQ, LL and CV—participated in drafting the manuscript. DSD and ENH—revised the manuscript. All authors contributed to editorial changes in the manuscript. All authors read and approved the final manuscript.

#### ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Baylor College of Medicine Institutional Review Board has given a blanket approval for all case reports. Approval number

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## CONFLICT OF INTEREST

The authors declare no conflict of interest. Dan Sebastian Dîrzu is serving as one of the Editorial Board members of this journal. We declare that Dan Sebastian Dîrzu had no involvement in the peer review of this article and has no access to information regarding its peer review. Full responsibility for the editorial process for this article was delegated to PB.

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