

Case Report

A Xiphoid Elongation Following a Trauma Laparotomy: A Case Report

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Article history:

Received: May 04, 2023

Revised: July 04, 2023

Accepted: July 04, 2023

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ABSTRACT

Xiphoid elongation is a rare phenomenon where the xiphoid process elongates after stimuli such as surgery, physical therapy, or trauma. We report on a 47-year-old male involved in a traffic accident who went into cardiac arrest. He received ongoing cardiopulmonary resuscitation for nine minutes before recovery of cardiac rhythm, and transfer from a local hospital to the trauma center. He received management for hypotensive shock which was temporarily corrected using Resuscitative Endovascular Balloon Occlusion of the Aorta, and underwent trauma laparotomy in which ileocolic artery ligation and a splenectomy were performed. Six months later, the patient reported epigastric discomfort when he bent over. A hard, linear mass was palpated along the upper midline incision scar and a computed tomography scan showed an elongated xiphoid process (10 cm). The patient underwent surgical excision, and electrocauterization of the xiphoid process. This is a rare case of xiphoid elongation following multiple stimuli to the xiphoid process.

Keywords: laparotomy, ossification, trauma, xiphoid process

Introduction

Xiphoid elongation (XE) is a phenomenon that has been reported in a small number of cases, and is where the xiphoid process becomes longer after stimuli such as surgery, physical therapy, or trauma [1-6]. This condition may cause discomfort and inflammation, which is described as "Xiphoid syndrome" when it occurs in conjunction with XE [3]. The mechanism of XE is not well understood, but it is believed to be caused by heterotopic ossification in the xiphoid process due to various stimuli including direct trauma to the chest wall and iatrogenic manipulation of the xiphoid process during surgery [3-6]. We report a case of a 47-year-old male patient who developed XE after a trauma laparotomy with long midline incision.

Case Report

A 47-year-old male was in a road traffic accident on his

motorbike and went into cardiac arrest at the scene. The patient was transferred to a nearby hospital and had ongoing cardiopulmonary resuscitation. After nine-minutes of cardiopulmonary resuscitation, the patient recovered a cardiac rhythm and was transferred to a trauma center after initial work-ups and resuscitative management.

Upon arrival at the trauma center, the patient was hypotensive, and the computed tomography scan taken at the initial hospital showed intra-abdominal contrast media extravasations. The hypotensive shock was temporarily corrected by initial resuscitation with the aid of Resuscitative Endovascular Balloon Occlusion of the Aorta. The patient underwent ileocolic artery ligation and splenectomy as a definitive surgery afterwards. Following surgery, the patient recovered without significant complications. The patient was discharged on the 28th postoperative day with outpatient follow-ups scheduled for non-abdominal injuries.

The patient came in for an outpatient appointment six months after the initial surgery complaining of epigastric discomfort

when he bends his body. A hard, linear mass was palpated along the upper midline incision scar and the patient was admitted for work-up and surgery. A rib computed tomography scan showed an elongated xiphoid process different from that before the trauma laparotomy. (Figures 1A and 1B) The patient underwent excision of the elongated xiphoid process. Electrocauterization was performed on the base of the xiphoid process for prevention of the recurrence. The length of the excised xiphoid process was 10 centimeters (Figures 2A and 2B). The patient was discharged on the 2nd postoperative day without complications and is free of symptoms to date.

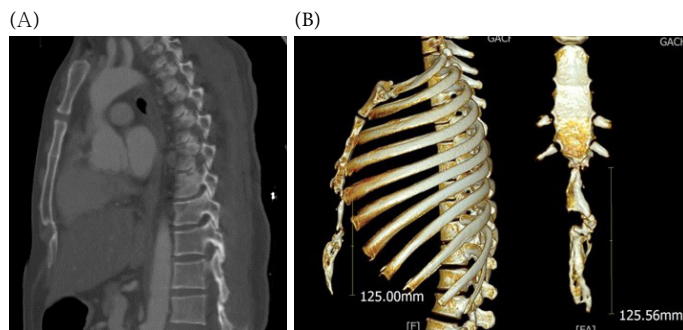


Figure 1. (A) Initial computed tomography scan before a trauma laparotomy showed a normal xiphoid process (arrow). (B) Rib computed tomography scan taken 6 months after the initial surgery showed elongated xiphoid process.

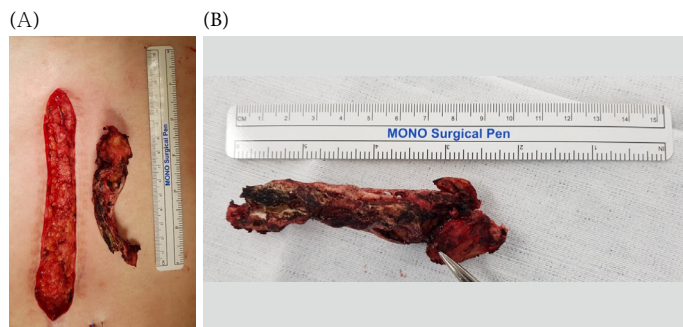


Figure 2. Excised elongated xiphoid process.

Discussion

Formation of XE is rare and the mechanism is not well understood. The occurrence of XE appearing after surgery is found following a midline laparotomy, which involves exposing the xiphoid process. XE following laparotomy has been rarely reported [4-5]. However, a study conducted on patients who underwent midline laparotomy revealed that heterotopic ossification occurred in a quarter of the total patients, indicating the possibility of XE occurring in a significant number of patients [7].

The treatment for XE is reserved for patients with symptomatic XE. Non-surgical treatment options such as analgesics or anti-inflammatory agents can be used for the mild symptom [8]. However, in cases where the discomfort is severe

enough that the patient complains of difficulty moving the body or if there is significant pain or inflammation, surgical excision of the xiphoid process is the only treatment option [5,8].

The prognosis of XE after the excision is good. In this case, to date, recurrence of XE has not occurred. Prevention of XE is not well established, but since it is believed to occur due to many different forms of physical stimuli to the xiphoid process, it is important to avoid unnecessary exposure of the xiphoid process during midline skin incision. Electrocauterization may be helpful in the prevention of XE in the future. However, its long-term prophylactic effect is unclear.

Author Contributions

Conceptualization: SKM and KKC. Manuscript writing: SKM and KCC. Manuscript review and editing: SKM, SJ, JL, KKC and HJY.

Conflicts of Interest

The authors have no conflicts of interest to disclose.

Funding

This case report did not require any financial support.

Ethical Statement

Informed consent was given by the patient. This case report was approved by Institutional Review Board of Gachon University Gil Medical center (no.: GDIRB2023-133).

Data Availability

All relevant data are included in this manuscript.

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