Case Report

Diaphragmatic hernia with isolated shoulder pain evoked by surfeit

Junghee Lee[1], Seung Hyuk Nam[2], Si-Wook Kim[3], Jong-Myeon Hong[3], Dohun Kim[3]

[1]Department of Thoracic and Cardiovascular Surgery, Samsung Medical Center, Seoul, Republic of Korea; [2]Department of thoracic and cardiovascular Surgery, Hanyang University Guri Hospital, Guri, Gyunggi, Republic of Korea; [3]Department of thoracic and cardiovascular Surgery, College of medicine, Chungbuk National University, Cheongju, Republic of Korea

Correspondence to: Dohun Kim, MD, PhD. Department of Thoracic and Cardiovascular, Surgery, College of Medicine, Chungbuk National University, 410 Sungbong-Ro, Heungduk-Gu, Cheongju, Chungbuk 361-763, Republic of Korea. Email: mwille@chungbuk.ac.kr.

Abstract: Bochdalek hernia in adult is extremely rare, so symptoms or indications of surgery are not reported enough. Here we report a case of small-sized Bochdalek hernia with isolated shoulder pain that resolved after surgical reduction of hernia. A 25-year-old man with diaphragmatic mass was referred to outpatient clinic. Chief complaint was an isolated left shoulder pain evoked by surfeit. Diaphragmatic hernia was suggested on chest computed tomography (CT) but it was not certain. So, video-assisted thoracic surgery (VATS) exploration was planned to clarify the diagnosis. The mass was proven to be the Bochdalek hernia and successfully restored into abdominal cavity. There were no postoperative complications and isolated shoulder pain disappeared clearly.

Keywords: Congenital diaphragmatic hernia (CDH); Bochdalek hernia; isolated shoulder pain; video-assisted thoracic surgery (VATS) exploration

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Case presentation

Congenital diaphragmatic hernia (CDH) in newborns and infants requires urgent operation due to instability of vital signs (1). However, adult diaphragmatic hernia is extremely rare and symptoms are sometimes vague or absent (2,3). Moreover, it is sometimes hard to diagnose only by chest computed tomography (CT), so inevitable surgical exploration, whether it was a thoracic or abdominal approach, is required (4,5), but there are still debates about the necessity of surgery (3).

Shoulder pain can be presented in diaphragmatic hernia but it usually accompanied with dyspnea, dysphagia, or chest discomfort in massive hernia (6). Although mediastinal mass could make an isolated shoulder pain (7) but it was hard to assume that a small-sized diaphragmatic hernia was the only cause of isolated shoulder pain and whether it would disappear by surgical reduction. Here we present the rare case of small-sized diaphragmatic hernia accompanying isolated shoulder pain resolved clearly after surgical reduction. Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

A 25-year-old male was referred to the hospital because of a mass on left diaphragm. The chief complaint was an isolated left shoulder pain that was evoked by surfeit. It developed every time he was overeating and persisted 60 to 90 minutes with 3 to 5 scores of numeric rating scales. There was no past medical history including trauma and orthopedics could not find any problems in the shoulder. Chest CT showed a homogeneous fatty mass on the left diaphragm. Since there was a continuity between the abdominal mesentery and the mass, it was assumed that diaphragmatic hernia, but it was uncertain radiologically (*Figure 1*). Further gastrointestinal work-ups did not performed because it seemed hard to offer additional information. Although there were neither pains nor signs of strangulation or infection, exploratory video-assisted thoracic surgery (VATS) was decided to confirm the characteristics of the mass.

Surgical exploration is performed under general

anesthesia via double lumen endotracheal intubation. Left pleural space was explored though the 7th intercostal space with 10 mm thoracoscopy and then additional 5 mm port was created on the 5th intercostal space crossing anterior axillary line. The fatty mass was noted on the posterolateral side of left diaphragm and partly adhered to it (*Figure 2A*). The mass has stalk and surrounding diaphragmatic defect were found. The mass seemed to have escaped through the defect. Mini-thoracotomy was performed via 7th intercostal space because it could not have restored into abdominal cavity by VATS. Diaphragm adjacent to the stalk was incised, and it was found that the hole and stalk was firmly adhered together (*Figure 2B*). With careful dissection, the stalk was mobilized from the hole and the mass was restored into the abdominal cavity through the hole. The diaphragm was repaired with interrupted monofilament suture (PROLENE® 1-0 by Ethicon Inc., Somerville, USA). He was discharged on the 5th postoperative day without complications. Shoulder pain disappeared after operation and did not develop until the recent follow-up at outpatient clinic (99th postoperative day).

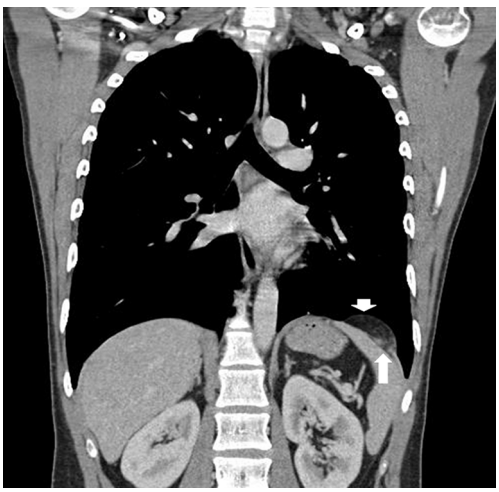

Figure 1 The CT image showing a diaphragmatic mass (wide arrow) of homogeneous fat tissues. It seemed to connect with mesentery via diaphragmatic hole (narrow arrow). CT, computed tomography.

Discussion

Diaphragmatic hernia with isolated shoulder pain was treated successfully after surgical reduction. It was thought to be the Bochdalek hernia because abdominal contents were on posterolateral portion of left diaphragm and the patient had no trauma history. This is the first case of isolated shoulder pain evoked by small-sized CDH within the scope of our knowledge.

Shoulder pain without regional problem is recognized as a kind of referred pain from phrenic nerve or diaphragm irritation. For example, irradiation to phrenic nerve has shown to be effective for shoulder pain in the case of thymic carcinoma (7). With our report, it was known that isolated shoulder pain without local cause could be developed by diaphragmatic hernia and it can be treated with surgical reduction. Therefore, surgical exploration would be inevitable in symptomatic CDH patients in spite of the size of defect.

However, imaging follow-ups rather than exploration would be another option for asymptomatic patients. As in our case, there was no evidence of incarceration or strangulation preoperatively. It may be because the stalk of the mass was firmly adhered in the hole of diaphragm, so it seemed that additional abdominal contents were hard to move into thoracic cavity. So, follow-ups without exploration can be recommended in incidentally founded, asymptomatic small-sized CDH patients.

In summary, isolated shoulder pain could be a

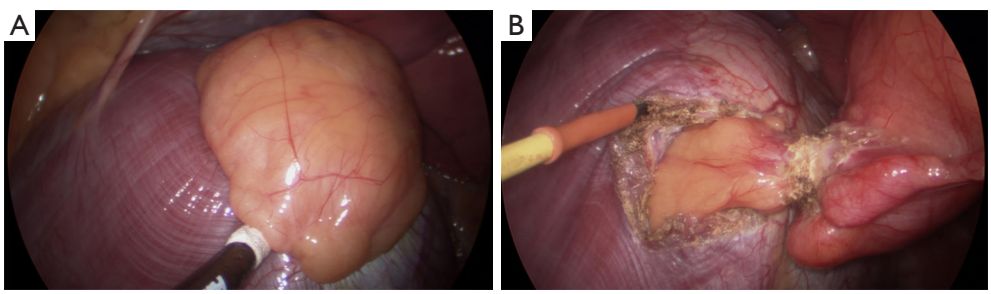

Figure 2 Surgical views of the diaphragmatic mass. (A) Fat mass without signs of strangulation or infection was found; (B) there is a stalk and it was tightly adhered around the hole.

manifesting symptom in adult CDH and it can be treated with surgical reduction. However urgent surgery may be unnecessary in asymptomatic, small-sized CDH patients, because of tight adhesion around the hernia.

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None.

Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

Informed Consent: Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

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