Plication for Diaphragmatic Eventration

A Simple Technique, Not a Simple Problem

To the Editor:

The case recently reported in CHEST by Hwang et al (July 2003) left three important questions open to readers. Even if technically simple, are we justified to propose surgical correction of a diaphragmatic eventration only on the basis of progressive dyspnea on exertion and chest radiograph findings? We do not think so.

At least two steps in the evaluation of this patient are missing.

1. Clinical history: if the patient has no previous chest radiograph, in our opinion the case has to be classified as a recently diagnosed eventration (ie, one known for <2 years). In this case, a long period of observation (at least 1 year) is needed to exclude the possibility of diaphragmatic function recovery. Moreover, in the assessment of diaphragmatic eventration, a detailed clinical history is crucial to determine the most likely cause. The presented case concerns a patient with a mediastinal deviation, which can cause troubles with cardiac rhythm. Has this aspect been investigated? In cases in which patients are aware of their eventration, dyspnea can be very difficult to quantify because they can easily translate their anxiety into a wide variety of respiratory symptoms. If this is the case, more qualifying signs, such as orthopnea, have to be searched for.

2. Radiologic evaluation: a CT scan is essential to rule out thoracic or abdominal disease, to assess the anatomic area of the phrenic nerve, and to evaluate lung parenchyma. On the basis of the presented chest radiograph, how can authors exclude the presence of a left main bronchus lung cancer with lymph node metastases of the aortopulmonary window?

The proposed technique is not that different from the video-assisted technique that we presented in 1996 and performed in 12 patients in the last 10 years. Do the proposed modifications improve the technique? This is questionable for several reasons. The only theoretical advantage to the modifications is the avoidance of a 5-cm minithoracotomy by the insertion of two 5-mm ports in the eight and ninth intercostal spaces (with possible injury to two different intercostal nerves). In such a situation, the surgeon starts the suture in the simplest position but ends up in the most difficult one, with the largest part of the eventration in the more distant zone.

The third question is which is the ideal correction for eventration? Hwang et al stated that the plication has to be performed from the anterolateral to the posteromedial costophrenic recess, and, at the end of the procedure, the diaphragm has to be tense on palpation. We disagree with both observations. With such a technique, a partial lateral correction is obtained, without the natural shape of the diaphragmatic dome being restored. Moreover, as it was described, the obtained diaphragm may be overcorrected. In our opinion, the best suture line runs from the midline of the posterolateral diaphragmatic dome to the level of the phrenic nerve. A good correction shows a diaphragm progressively ascending from the attachments just below the posterior minithoracotomy, assuming a horizontal portion at the level of the cardiophrenic angle. If the diaphragm overcomes this angle, it has been undercorrected. If the diaphragm becomes a linear, flat, oblique, and hard plane between its costodiaphragmatic portion and the cardiophrenic angle, it has been overcorrected (Fig 1).

Finally, a single running suture cannot be enough for a structure such as the diaphragm, which continuously changes its natural shape of the diaphragmatic dome being restored. Moreover, as it was described, the obtained diaphragm may be overcorrected. In our opinion, the best suture line runs from the midline of the posterolateral diaphragmatic dome to the level of the phrenic nerve. A good correction shows a diaphragm progressively ascending from the attachments just below the posterior minithoracotomy, assuming a horizontal portion at the level of the cardiophrenic angle. If the diaphragm overcomes this angle, it has been undercorrected. If the diaphragm becomes a linear, flat, oblique, and hard plane between its costodiaphragmatic portion and the cardiophrenic angle, it has been overcorrected (Fig 1).

Finally, a single running suture cannot be enough for a structure such as the diaphragm, which continuously changes its profile.

Francesco Leo, MD, FCCP
Nicolas Venissac, MD
Fernando Morales, MD
Andres Rodriguez, MD
Jerôme Mouroux, MD
University Hospital of Nice
Nice, France

References


Figure 1. At the end of the plication, the diaphragm should have a normal profile (left, a), avoiding undercorrection (middle, b) and overcorrection (right, c).

Correspondence to: Francesco Leo, MD, FCCP, Thoracic Surgery Department, Pasteur Hospital, 30 Ave de la Voie Romaine, 06002 Nice, France; e-mail: francescoleo@interfree.it

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Correspondence to: Francesco Leo, MD, FCCP, Thoracic Surgery Department, Pasteur Hospital, 30 Ave de la Voie Romaine, 06002 Nice, France; e-mail: francescoleo@interfree.it

References


To the Editor:

We appreciate the interest in our case report (July 2003) and the comments made by Leo and colleagues. They pointed out several problems, including evaluation of the patient, minithoracotomy, and direction of the repair.

The most important step in the evaluation of the patient is the search for the cause of disease. In our case, we had been observing the patient for about 6 years when the operation was performed. A chest CT scan obtained with the patient in the posteroanterior position 6 years before the operation showed...
unilateral diaphragmatic elevation without mediastinal deviation (Fig 1). Instead of the expected functional recovery taking place, elevation of the diaphragm had been aggravated over time. And other causative diseases could not be found despite our efforts. ECG and two-dimensional echocardiogram showed normal findings. On the enhanced chest CT scan, we could not find any abnormal lesions, giving rise to a diagnosis of eventration (ie, a mass around the phrenic nerve, lung parenchymal lesions, cancer, or mediastinal lymphadenopathy). But the left diaphragmatic crux was not visualized at the lower level of the chest CT scan (Fig 2). In cases in which the patient is aware of the eventration, we think that dyspnea could be caused by psychosomatic problems. Leo and colleagues mentioned that this would be very difficult to quantify.

We reviewed some of the literature on this topic, including the article by Mouroux et al, in terms of the technique used for the operation. In our article, we did not use any kind of thoracotomy. Four small incisions for the thoracoscopic ports were used during the plication. In the past, I actually have used posterior thoracotomy to open the chest in an effort to spare the serratus muscle. We think that the most important point is not what kind of incision was made, but how rib spreading can be avoided. Usually, postoperative pain is the most troublesome problem after undergoing a thoracotomy. This annoying pain is caused by rib spreading rather than by multiple intercostal incisions. And some kinds of pure thoracoscopic surgery for plication can be technically difficult. So, I think that any kind of thoracotomy incision, including minithoracotomy, is acceptable, if the surgeon can avoid rib spreading.

As Leo and colleagues mentioned, the anterolateral costophrenic recess is the simplest site at which to start the plication. The posteromedial costophrenic recess is initially obscured by the elevated dome of the diaphragm, but could be gradually brought into view by flattening the diaphragm and keeping the suture under tension.

Finally, on the basis of our experience, even when we have performed enough of a correction to the diaphragm with interrupted sutures, the profile of the diaphragm changes. That is the reason we overcorrect the diaphragm.

Jae Seung Shin, MD, PhD
Korea University Medical College
Gyeonggi-do, South Korea

Sarcoidosis Cycle

To the Editor:

I read with interest the article by Dr. Reich and its editorial comments by Marc Judson (July 2003) citing experience and published studies particularly over the past 10 years on the nature of sarcoidosis. Dr. Reich argues, “there is not any one single agent and that there is not one discrete immunologic defect that causes sarcoidosis” (per Dr. Judson’s comments).

This conclusion seemed to me to be reminiscent of the opinion held by my mentor, Richard A. DeRemee, MD, during my years...