

Interactive CardioVascular and Thoracic Surgery

Extended posterolateral–subcostal thoracotomy for extrapleural pneumonectomy: a surgical approach for radical operation of pleural mesothelioma

Kotaro Kameyama, Cheng-long Huang, Eiichi Hayashi and Hiroyasu Yokomise

Interact CardioVasc Thorac Surg 2004;3:201-203

DOI: 10.1016/j.icvts.2003.11.001

The online version of this article, along with updated information and services, is located on the World Wide Web at:

<http://icvts.ctsnetjournals.org/cgi/content/full/3/1/201>

Interactive Cardiovascular and Thoracic Surgery is the official journal of the European Association for Cardio-thoracic Surgery (EACTS) and the European Society for Cardiovascular Surgery (ESCVS).
Copyright © 2004 by European Association for Cardio-thoracic Surgery. Print ISSN: 1569-9293.



ELSEVIER

Interactive Cardiovascular and Thoracic Surgery 3 (2004) 201–203

INTERACTIVE
CARDIOVASCULAR AND
THORACIC SURGERY

www.icvts.org

Work in progress report - Thoracic general

Extended posterolateral–subcostal thoracotomy for extrapleural pneumonectomy: a surgical approach for radical operation of pleural mesothelioma

Kotaro Kameyama, Cheng-long Huang, Eiichi Hayashi, Hiroyasu Yokomise*

Second Department of Surgery, Kagawa Medical University, 1750-1, Miki-cho, Kita-gun, Kagawa 761-0793, Japan

Received 12 June 2003; received in revised form 7 October 2003; accepted 11 November 2003

Abstract

Extrapleural pneumonectomy is an essential procedure in multimodality therapy of malignant pleural mesothelioma. However, radical resection may be difficult in a standard posterolateral thoracotomy because the edge of the diaphragm is located in the dead angle of the pleural cavity. We have tried a subcostal thoracotomy following a posterolateral thoracotomy (extended posterolateral–subcostal thoracotomy) for extrapleural pneumonectomy. With extended posterolateral–subcostal thoracotomy, ideal surgical resection, with en bloc removal of the lung, parietal pleura, pericardium and diaphragm, can be performed radically, but safely, without a second thoracotomy. We conclude that extended posterolateral–subcostal thoracotomy is an effective approach for extrapleural pneumonectomy.

© 2003 Elsevier B.V. All rights reserved.

Keywords: Thoracotomy; Pleural cavity; Mesothelioma; Pleural disease; Diaphragm

1. Introduction

Wide exposure of the pleural cavity is required in some cases in thoracic surgery. Extrapleural pneumonectomy is an essential procedure in multimodality therapy of malignant pleural mesothelioma [1,2]. A radical resection should be performed to obtain tumor-free resection margins [3]. However, this may be difficult in a standard posterolateral thoracotomy because the edge of the diaphragm is located in the dead angle of the pleural cavity. Sometimes, a second thoracotomy is required. Therefore, we attempted a subcostal thoracotomy following a posterolateral thoracotomy (extended posterolateral–subcostal thoracotomy) for an extrapleural pneumonectomy requiring adequate exposure of the diaphragm.

2. Surgical technique

A standard posterolateral incision is extended along the anterior costal arch (Fig. 1). A blunt dissection is begun

extrapleurally at the fifth intercostal space, and the parietal pleura is stripped off the chest wall. The sixth and seventh costal cartilages are transected after the dissection reaches the anterior chest wall. The rectus abdominis, external abdominal oblique, internal abdominal oblique, and transversus abdominis muscles are dissected from the costal arch and the peritoneum is exposed. A blunt dissection divides the peritoneum from the diaphragmatic muscle. Subsequent procedures follow the technique proposed by Sugarbaker and colleagues [1]. Radical surgical resection is performed, with en bloc removal of the lung, parietal pleura, pericardium and diaphragm. Reconstruction of the diaphragm and pericardium is carried out with prosthetic impermeable patches. The transected sixth and seventh costal cartilages are closed with a heavy stainless steel wire suture.

Extrapleural pneumonectomy was performed using extended posterolateral–subcostal thoracotomy in four patients (right side 3, left side 1) with malignant pleural mesothelioma. This approach provided wide and continuous exposure of the pleural cavity from the diaphragm to the apex in all patients (Fig. 2A). A blunt dissection easily divided the diaphragm to preserve the underlying peritoneum while providing adequate exposure of the diaphragmatic edge (Fig. 2B). There were no postoperative

* Corresponding author. Tel.: +81-87-891-2191; fax: +81-87-891-2192.
E-mail address: yokomise@kms.ac.jp (H. Yokomise).

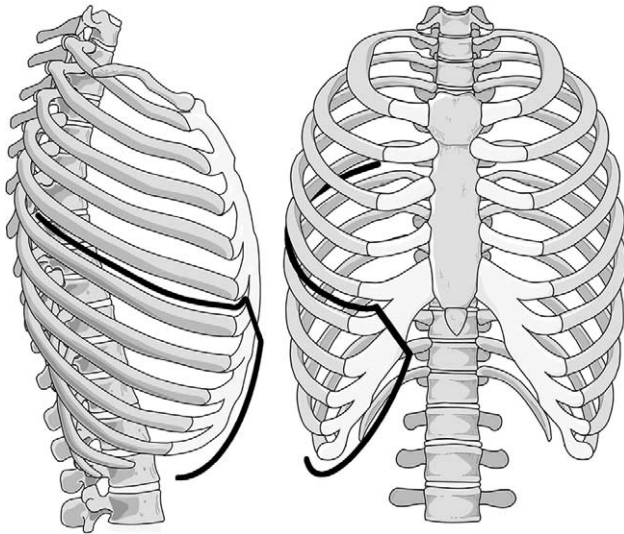


Fig. 1. The incision line of the right extended posterolateral–subcostal thoracotomy.

complications that were directly attributable to the extended posterolateral–subcostal thoracotomy. Postoperative pains, sufficiently controlled with epidural anesthesia, were at the same level as pain from a standard posterolateral thoracotomy.

3. Discussion

Extrapleural pneumonectomy is an essential procedure in multimodality therapy of malignant pleural mesothelioma [1,2]. Some reports have described extrapleural pneumonectomy for selected cases of malignant disease, such as advanced lung cancer and thymic malignancies [4,5]. Although the operative mortality of extrapleural pneumonectomy has been decreasing, it is still one of the most invasive thoracic surgeries [2]. In extrapleural pneumonectomy, radical resection should be performed to obtain tumor-free resection margins [3]. However, radical resection may be difficult in a standard posterolateral thoracotomy. We feel that resection is quite difficult because the edge of the diaphragm is located in the dead angle of the pleural cavity. Indeed some reports state that a second thoracotomy in the ninth or tenth intercostal space is available in such cases [6], but the second thoracotomy does not provide continuous exposure, and the view from the thoracotomy is narrow. The extended posterolateral–subcostal thoracotomy was designed to provide wide and continuous exposure of the pleural cavity from the diaphragm to the apex. With this thoracotomy, ideal surgical resection, with en bloc removal of the lung, parietal pleura, pericardium and diaphragm, can be performed radically, but safely. Because this approach provides adequate exposure of the diaphragmatic edge, a blunt

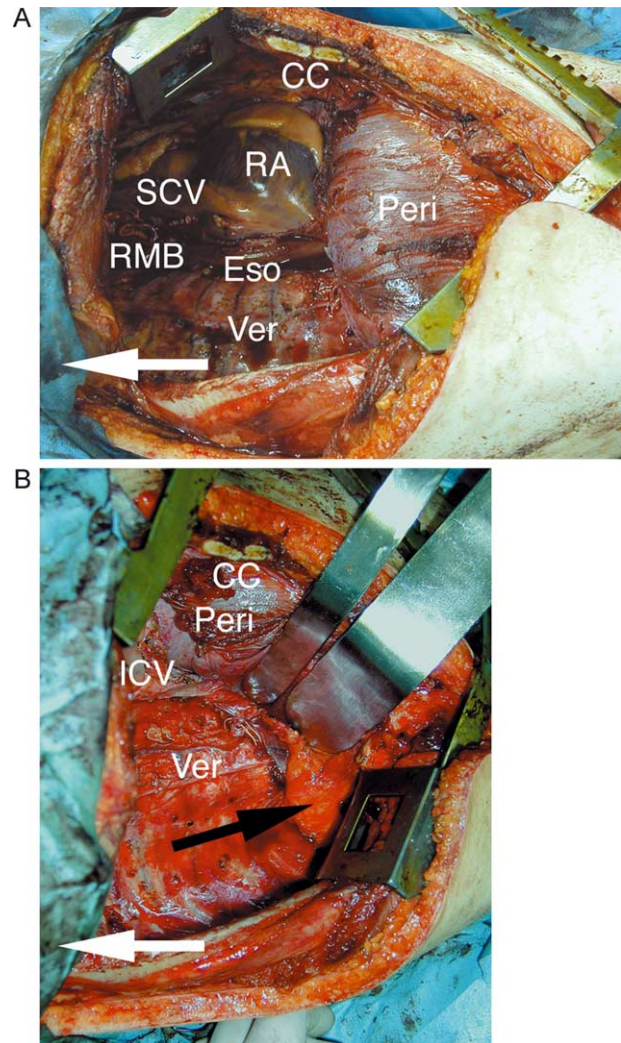


Fig. 2. (A) The right pleural cavity after extrapleural pneumonectomy. (B) The right costophrenic angle after extrapleural pneumonectomy. White arrows indicate the head side. A black arrow indicates the retroperitoneal fat pad under the diaphragm. CC, costal cartilages; Eso, esophagus; ICV, inferior caval vein; Peri, peritoneum; RA, right atrium; RMB, right main bronchus; SCV, superior caval vein; Ver, vertebra.

dissection easily divides the diaphragm to preserve the underlying peritoneum. This thoracotomy can also be extended from a standard posterolateral thoracotomy. We conclude that extended posterolateral–subcostal thoracotomy is an effective approach for extrapleural pneumonectomy.

References

- [1] Sugarbaker DJ, Mentzer SJ, Strauss G. Extrapleural pneumonectomy in the treatment of malignant pleural mesothelioma. *Ann Thorac Surg* 1992;54:941–6.
- [2] Sugarbaker DJ, Garcia JP, Richards WG, Harpole Jr. DH, Healy-Baldini E, DeCamp Jr. MM, Mentzer SJ, Liptay MJ, Strauss GM, Swanson SJ. Extrapleural pneumonectomy in the multimodality

- therapy of malignant pleural mesothelioma. Results in 120 consecutive patients. *Ann Surg* 1996;224:288–94.
- [3] Grondin SC, Sugarbaker DJ. Pleuropneumonectomy in the treatment of malignant pleural mesothelioma. *Chest* 1999;116:450S–4S.
- [4] Yokoi K, Matsuguma H, Anraku M. Extrapleural pneumonectomy for lung cancer with carcinomatous pleuritis. *J Thorac Cardiovasc Surg* 2002;123:184–5.
- [5] Refaely Y, Simansky DA, Paley M, Gottfried M, Yellin A. Resection and perfusion thermochemotherapy: a new approach for the treatment of thymic malignancies with pleural spread. *Ann Thorac Surg* 2001;72:366–70.
- [6] Bedini AV, Andreani SM, Muscolino G. Latissimus dorsi reverse flap to substitute the diaphragm after extrapleural pneumonectomy. *Ann Thorac Surg* 2000;69:986–8.

Extended posterolateral–subcostal thoracotomy for extrapleural pneumonectomy: a surgical approach for radical operation of pleural mesothelioma

Kotaro Kameyama, Cheng-long Huang, Eiichi Hayashi and Hiroyasu Yokomise

Interact CardioVasc Thorac Surg 2004;3:201-203

DOI: 10.1016/j.icvts.2003.11.001

This information is current as of February 23, 2007

Updated Information & Services	including high-resolution figures, can be found at: http://icvts.ctsnetjournals.org/cgi/content/full/3/1/201
Subspecialty Collections	This article, along with others on similar topics, appears in the following collection(s): Diaphragm http://icvts.ctsnetjournals.org/cgi/collection/diaphragm Lung - cancer http://icvts.ctsnetjournals.org/cgi/collection/lung_cancer Lung - other http://icvts.ctsnetjournals.org/cgi/collection/lung_other Pleura http://icvts.ctsnetjournals.org/cgi/collection/pleura
Permissions & Licensing	Requests to reproducing this article in parts (figures, tables) or in its entirety should be submitted to: icvts@ejcts.ch
Reprints	For information about ordering reprints, please email: icvts@ejcts.ch

Interactive CardioVascular and Thoracic Surgery