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ORIGINAL ARTICLE

Single-port thoracoscopic surgery can be a first-line approach for elective thoracoscopic surgery

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KEYWORDS
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Abstract
Background: Thoracoscopic surgery has become very popular in recent years. Conventional thoracoscopic surgery requires three or more port wounds for manipulations of endoscopic instruments. For complicated cancer surgery, more port wounds and a larger thoracotomy wound may be required due to technical reasons. We want to investigate the effectiveness of single-port thoracoscopic approach in elective thoracoscopic surgery for thoracic disease.
Materials and methods: From July 1st, 2010 to March 31, 2011, 90 consecutive patients underwent general thoracoscopic surgery performed by the same thoracic surgeon. Two patients with severe trauma and massive bleeding were excluded from the study. All patients included had thoracoscopic surgery with a single-port approach. The surgical outcomes, complications, mortality and conversion rates were recorded and analyzed.
Results: A total of 88 patients were included in this study. All these patients were operated on by the same surgeon. For sixty-eight patients, the single-port thoracoscopic approach was used. Nineteen patients were changed to a two-port thoracoscopic approach and one patient's was changed to mini-thoracotomy. Two patients died from terminal lung cancer and severe mitral regurgitation. Complications occurred in six cases. Eighty-seven patients (98.8%) were effectively managed with either single-port or a two-port approach. Only one patient was managed by mini-thoracotomy.
Conclusion: Elective thoracoscopic surgery performed through a single-port wound is feasible. Single-incisional thoracoscopic surgery can be safely applied as a first-line approach in most cases of elective thoracoscopic procedures.

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PALAVRAS-CHAVE
Torascopia;
Cirurgia toracoscópica video-assistida;
Cirurgia Endoscópica de incisão única

Cirurgia toracoscópica de porta única (single-port) pode ser uma abordagem de primeira linha para a cirurgia toracoscópica eletiva

Resumo
Introdução: A cirurgia toracoscópica tornou-se muito popular nos últimos anos. A cirurgia toracoscópica convencional requer três ou mais incisões para manipulação dos instrumentos endoscópicos. Para cirurgias de cancro complicadas, podem ser requeridas mais incisões e uma incisão toracotomia maior, por razões técnicas. Pretendemos investigar a eficácia da abordagem toracoscópica de incisão única em cirurgias toracoscópica eletivas.
Materiais e métodos: Desde 1 de julho de 2010 até 31 de março de 2011, 90 pacientes consecutivos foram submetidos a cirurgia toracoscópica geral realizada pelo mesmo cirurgião torácico. Dois pacientes com trauma grave e hemorragia massiva foram excluídos do estudo. Todos os pacientes incluídos foram submetidos a cirurgia toracoscópica com uma abordagem de incisão única. Os resultados cirúrgicos, complicações, mortalidade e taxas de conversão foram registados e analisados.
Resultados: Um total de 88 pacientes foram incluídos neste estudo. Todos estes pacientes foram operados pelo mesmo cirurgião. Para sessenta e oito pacientes, foi usada a abordagem de incisão única torácica. Dezanove pacientes foram convertidos para uma abordagem dupla porta e um paciente convertido em mini-toracotomia. Dois pacientes morreram de cancro do pulmão terminal e regurgitação mitral grave. Ocorreram complicações em seis casos. Oitenta e sete pacientes (98,8%) foram tratados eficazmente com uma abordagem de incisão única ou de incisão dupla. Apenas um paciente foi tratado por mini-toracotomia.
Conclusão: A cirurgia toracoscópica eletiva realizada através de incisão única é viável. A cirurgia toracoscópica de incisão única pode ser aplicada em segurança como uma abordagem de primeira linha na maioria dos casos de procedimentos toracoscópicos eletivos.

Introduction

Thoracoscopic surgery has been developing over several years. At present, it is very popular in many institutions. In order to handle the endoscopic instruments with ease, thoracic surgeons usually need three or more small port wounds. One of the port wounds is usually intended for the rigid endoscope. A second port wound is utilized for manipulation of grasping instruments to search for lesions and hold the suspicius lesion to be resected. A third wound is usually for a stapler or other instruments to assist dissection. An obvious benefit of multi-port wounds is that the function of port wounds is inter-changeable. When the thoracic surgeon initially creates a wound but then finds the field-of-view is very limited due to adhesion or fibrosis, a second wound might help to change the viewing field. If the second wound fails, the third wound would usually be successful. Owing to the limitations of the semi-rigid nature of the thoracic cage, an inappropriate port wound is essentially redundant. The preoperative planning of the port wound is crucial for successful single-port thoracoscopic surgery. We want to find out if routine thoracoscopic operations can be safely accomplished with single-port thoracoscopic techniques.

Materials and methods

From July 1st, 2010 to March 31st, 2011, 90 consecutive patients underwent general thoracoscopic surgery by the same thoracic surgeon. Two patients with severe trauma and massive bleeding were excluded from the study. All patients who had been initially indicated for thoracoscopic surgery in our team were included except any patient for whom open surgery had initially been planned. All procedures were performed by the same thoracic surgeon in order to avoid the effect of the varied experience of different thoracic surgeons. Patient data were prospectively recorded and patients were followed in the outpatient department for at least six months after operation.

The preoperative evaluation and techniques of anesthesia were routine, like any normal anesthesia. Patients are intubated with a double-lumen endotracheal tube after sufficient induction of anesthesia to allow single-lung ventilation. Not all patients received intravenous or epidural patient-controlled anesthesia. The endoscope we used in the procedure was 5 mm in diameter with 30° viewing angle. Whenever possible, we removed the endotracheal tube immediately after the procedure. Most patients were transferred to intensive care units (ICU) for observation for one night.

Our surgical strategy was very straightforward. With patients for thoracoscopic surgery, we always tried a single-port approach to complete the procedure. If technically unavoidable, we made a second port wound and then completed the procedure. In case of difficulty, a mini-thoracotomy or thoracotomy would be made to continue the procedure. A port wound is defined as any wound less than 3.5 cm at the longest point. A port wound is usually 1.5 cm for uncomplicated procedure (Fig. 1A). Mini-thoracotomy is defined as a wound greater than 3.5 and less than 7 cm.