Review Article on Thoracic Surgery

Ethical aspects of a video-assisted thoracoscopic surgery practice

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Abstract: Thoracic surgery is a field encompassing many diverse operative techniques ranging from open surgeries involving thoracotomies and sternotomies to less invasive operations such as video-assisted thoracoscopic surgery (VATS), endoscopy, and bronchoscopy. The popularity and acceptance of VATS has been increasing over time. Ethical considerations must be used to navigate patient misconceptions of VATS surgery, creating an appropriate informed consent process, determining appropriate patients for VATS, training future thoracic surgeons in VATS, and advancing thoracic surgery innovation. Thoracic surgeons are the gateway to determine what operation and what technique is appropriate to offer to each patient. This requires strict adherence to ethical standards as well as self-regulation.

Keywords: Ethics; thoracic surgery; video-assisted thoracoscopic surgery (VATS)

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Introduction

Thoracic surgery is a field encompassing many diverse operative techniques ranging from open surgeries involving thoracotomies and sternotomies to less invasive operations such as video-assisted thoracoscopic surgery (VATS), endoscopy, and bronchoscopy. As with any field with a wide range of therapeutic options to offer patients, discussions arise on when it is appropriate to offer and utilize less invasive techniques. While patients are often attracted to more minimally invasive surgical solutions, ideally these discussions should revolve around indications and outcomes. In the following pages we will discuss some of the ethical issues pertaining to surgery in general but will focus on the application of ethics to thoracic surgery, VATS, and minimally invasive innovation.

Ethics background

In bioethics, four principles are frequently used to describe and interpret ethical situations: respect for persons—permitting patients to be active in decisions about their own medical care (1); non-maleficence—avoiding harm; beneficence—maximizing benefit; and justice—equitable and fair (2). Although it is not necessary to apply these principles in every case, they are helpful in addressing other issues often faced in clinical practice.

To interpret clinical ethics, a four-box model was developed to provide a structured context for evaluation of medical ethical scenarios (3). A narrowing of the four-box model has been recently described to focus specifically on its application to surgical ethics (4). Such an approach allows for the impact of ethical decisions to be analyzed against the full context of a patient's surgical situation. The four-box model prevents a surgeon from only focusing on the medical issues and broadens awareness to other aspects of a patient's life and treatment. When utilizing the four-box model to analyze the ethical issues of a case, the following areas should be considered: Medical Indications—goals, likely success of surgery, and alternatives; Patient Preferences—risk, benefits, and preferences; Quality of Life—baseline functionality, current lifestyle, and expected

time to recovery; Contextual Features—conflicts of interest, personal interests, and financial incentives. Although broad and applicable to all surgical fields, this approach is also appropriate for thoracic surgery.

VATS

Since it was described in the 1990s the popularity and acceptance of VATS has been increasing over time. For patients requiring a lobectomy, studies have demonstrated equivalence in morbidity, mortality, and oncologic outcome at 5 years (5-8). Some areas such as length of stay and cost may even be superior in VATS (7,9). There are still areas where the appropriateness of VATS is less defined such as for late-stage lung cancer, VATS sleeve lobectomy, thoracic trauma, rib resections, or low-resource medical environments (10-12).

Patient misconception

Patients are regularly searching for the least invasive treatment for their surgical care. The internet and hospital advertisements often display the most innovative and least invasive surgical solutions to health problems. Patients often misconstrue a minimally invasive operation as a simple procedure and quick recovery. It is the role of the surgeon, and a requirement in adequate informed consent, to confirm that the patient understands that VATS is still a large, life-impacting surgery albeit through smaller incisions. While VATS is an appropriate tool under the correct indications, thoracic surgeons must be sure to inform patients that smaller incisions do not imply lower risk surgery.

Using the four-box model, this would apply to patient preferences as they are seeking a more minimally invasive procedure. But this is where the thoracic surgeon needs to be able to address the medical indications and applicability of VATS to a patient's specific situation while eliminating contextual features such as hospital and societal pressure to offer new and minimally invasive techniques.

Informed consent

It would be an oversight to discuss the ethics of thoracic surgery without discussing the value of true informed consent. Every operation is known to have identified complications that are possible even with skilled and seasoned surgeons (13). But every conversation about a detailed and complicated operation offers an opportunity for a surgeon to shade the conversation with a positive or negative hue. The important part of performing surgery is to ensure that patients are informed about the intent of surgery and the possible risks associated with the operation—providing maximal respect for persons. Informed consent for a procedure is when the surgeon and patient have a discussion regarding the indications, alternatives, risks, and desired outcomes of a specific operation while sufficiently answering the patient's questions. This discussion should be as forthright as possible without manipulation, even ever so slightly, so the patient can make an educated and informed decision.

Discussing operations and options is easy when a procedure has been done for decades and long-term outcomes are described. This proves more difficult with newer techniques and applications for those techniques. How does a surgeon adequately discuss risks and long-term outcomes if the true 10-year benefit is unknown (14)? When an operation, traditionally done open, is then offered minimally invasively, the risks of the traditional open operation are known but do not necessarily translate over directly to the new technique. A perfect example of this challenge is VATS lobectomy; long term oncologic equivalence with open lobectomy is still yet to be seen (7). As VATS is further developed and adapted to other surgical applications, this will continue to pose an issue during the consent process. Here surgeons must take the path of being open and honest with patients; identifying what is known and unknown but yet acknowledging that VATS may still be appropriate and benefit the patient.

Patient condition

At times a patient may be encountered who is a surgical candidate if the resection can be done via VATS but would be a poor surgical candidate if the operation was to necessitate an open thoracotomy. As every VATS case may require conversion to an open operation, these scenarios require honest discussion with the patient. This specific patient group has been previously identified in the literature, and outcomes reviewed, but no guidelines for navigation of this ethical scenario was provided (15). Here the four-box model may again provide structure to navigate the scenario in depth. The medical indications of the operation, goals of treatment, likelihood of success, complications, and alternatives, such as radiofrequency ablation for non-small cell lung cancer, must be discussed with the patient. Here patient preferences play a role while

ensuring the risks and benefits are understood. The quality of life after the operation must be discussed with the patient identifying the differences between completing VATS versus thoracotomy including duration of hospital stay and post-operative recovery. After these discussions, two patients that have similar tumors and similar underlying medical conditions may reach different decisions about what is the "best" operation based on their different personal goals and expectations.

Ease of intraoperative conversion

Patients frequently come to surgical clinics searching for minimally invasive operations—for thoracic surgery this usually is VATS although this could also apply to an endoscopic or bronchoscopic intervention. For example, it is much more attractive to the patient when they are told their cancer can be removed through four small incisions instead of a thoracotomy. In the consent process, this is usually followed by informing the patient that if the operation cannot be performed adequately or safely via VATS, that a thoracotomy will be made for completion of the surgery. Surgeons know that there is a sliding scale of ease for procedures and that it changes for each specific patient. For example, while a redo VATS is entirely possible, the risk of conversion to thoracotomy for such a case would be higher than a patient who is undergoing VATS for the first time. Where the need for conversion to an open procedure lies for a specific patient, no surgeon exactly knows while talking to the patient in the office; however, the importance of a balanced discussion focusing on patient safety and outcomes is essential.

It is very important to be honest with the patient and discuss the real and patient specific risk of need for conversion to an open operation. This applies the medical indications of the four-box model. Here, the treatment options, alternatives, and likelihood of treatment completion thoracoscopically need to be available to the patient. At no time should the benefits of VATS for a specific case be overemphasized. It has been previously mentioned and discussed that surgeons often know that some cases will require thoracotomies yet still suggest that VATS can be attempted (16). It is often more appropriate that these scenarios simply start as open thoracotomy cases.

Is open surgery obsolete?

Many surgical specialties have seen an increase in minimally invasive surgeries supplementing or replacing open operations. For example, this has become common trend in general, bariatric, and vascular surgery. Likewise, thoracic surgery has seen appropriate growth and utilization of VATS and many traditionally open operations are seeing attempts at VATS (10-12). It is the responsibility of the thoracic surgeon to ensure appropriate application of VATS to each specific patient. While the future of all surgery may continue to be less invasive and involve smaller incisions, this does not mean that the level of surgery being performed is of any less magnitude.

Training in thoracic surgery

The array of surgical operations offered as VATS and open surgery increases the training needed for future thoracic surgeons. Trainees need to be able to offer their patients the minimally invasive operations demanded by society and at the same time have the skill set to also perform open surgery when indicated or fall back on open surgery when needed to convert during an operation. This increases the breadth of training required in thoracic surgery to VATS, thoracotomies, endoscopic interventions, and bronchoscopic interventions. Fellowship training should utilize the laparoscopic skill set of the fellow trained in general surgery to improve VATS ability while simultaneously training fellows in open surgery. Equally important to the operative steps and skills is the clinical knowledge of appropriate indications for VATS and open surgery (16). The future thoracic surgeon will only be competitive if able to offer the most innovative operative solutions and yet utilize the traditional open techniques when appropriate.

Minimally invasive innovation

Like any field, surgery requires and demands innovation. The surgical world, however, is different from other areas of innovation because here the success or failure of an innovation directly impacts the patient (17). Surgeons are obligated to disclose any change that would have a significant effect on the patient (17). While there is pressure for hospital health systems and patients to utilize new techniques and technologies, surgeons must guard the patient's interests and outcomes (17).

Surgical innovation often occurs as a surgeon attempts to solve a problem for an individual patient and this usually occurs as incremental changes over time (14). The balance of surgical creativity in the operating room and lack of

surgical regulation and standardization places a large burden on the surgeon to act in the best interest of the patient (14). As published literature continues to confirm that many minimally invasive techniques are equal to open operations, every surgeon must also know their own limitations when offering VATS and advanced minimally invasive techniques to patients.

Future investigations

There are often many drivers of innovation and minimally invasive techniques. In surgery, one of the large drivers for minimally invasive operations is patient preference for an operation with smaller incisions. This patient preference for a minimally invasive option is typically in lieu of complete comprehension of what operation is therapeutically best or most appropriate for a patient's specific situation. Further investigation is needed to determine what patients are willing to sacrifice in terms of complications, increased risk, and additional procedures in order to have an operation with smaller incisions. Exactly how much risk are patients willing to accept to undergo a more minimally invasive operation?

The counter point to this is from the surgeon's perspective. What increased risk and need for subsequent or repeat operations is permissible for the surgeon to still offer a less definitive, but less invasive, operation to a patient; especially in the context of a patient willing to accept additional risks? At some point, a surgeon will feel uncomfortable offering an operation if risks are too high or likelihood of definitive success too low. Currently, literature lacks a description of where patients and surgeons agree on what level of risk is permissible to the patient and still appropriate for the surgeon to offer. This overlap and agreement is exactly the area where surgical innovation for less invasive operations should occur.

Conclusions

Minimally invasive techniques, specifically VATS, are here to stay. This discussion provides an overview of many of the ethical issues surgeons should consider when discussing such cases with patients. While some of these topics were discussed briefly, further discussion and elaboration is warranted in most areas especially as they pertain specifically to thoracic surgery. Thoracic surgeons are the gateway to determine what operation and what technique is appropriate to offer to each patient. This requires strict adherence to ethical standards as well as self-regulation.

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Footnote

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

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