

Video-assisted thoracic surgery? Yes, but the best interest of the patient always first

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It is undeniable the advance resulted from the application of video-assisted techniques to thoracic surgery, rapidly identified by the acronym video-assisted thoracic surgery (VATS).

More than two decades later, what initially appeared to be limited to minor diagnostic procedures, even capable to be performed by pneumonologists, has evolved to become the predominant technique for major procedures in many thoracic surgery centers around the world.

For those of us who have initiated this surgical specialty trained in what by those times was the almost unique approach, the full posterolateral thoracotomy, additionally to become privileged witnesses of the appearance and evolution of VATS, we had to learn a completely different way to work into the chest even without having acquired necessary abilities in previous general surgery training.

Although I'm not an expert, I do consider that many, perhaps the majority of thoracic surgery procedures should be nowadays performed by VATS. The relatively new variant, uniportal VATS, is one step forward in the same direction.

But witnessing the whole evolutionary process, allow us to perceive that several aspects of VATS are not adequately alluded either in the literature or at meetings discussions.

In the preface of a recent publication Tan *et al.* (1), mention several well known proverbs and thoughts referred to the positive aspect of a proactive attitude of searching for better, simpler, quicker and even cheaper ways to obtain similar or better surgical results by developing new abilities and taking advantage of new technology. I would add Arthur Clarke's suggestion that "...the only way of discovering the limits of the possible is to venture a little way into the impossible".

Nevertheless, I believe it is worthwhile to pay attention at some expressions and words used by Tan *et al.*

First of all, I cannot imagine how in practice, some "forces" might "interrupt" scientifically demonstrated advances. I do believe however that more cautious attitude may cast doubts for some time until complete evidence of benefit is rigorously demonstrated. Some surgeons, instead of taking responsibilities before their patients just with the pioneer's certainty that the new technique is in his/her hands "feasible", "safer" and "effective", they choose to wait until became demonstrated that the procedure is additionally reproducible and, above all, late results are similar or better.

Possibly, by no means they want to interrupt any course of progress but they are anxiously waiting that expressions like "can be performed", "emerging evidence" or "selected patients", on scientific bases being replaced by "should be performed", "demonstrated evidence" or "established criteria for selection of patients". Probably they need to be certain that they are not watching, as sometimes appears a competence between proactive and retrogrades in which the interest of the industry is not an innocent partner.

I do believe that VATS (and uniportal VATS) are here to stay and grow but we all must be aware that as Tan *et al.* advise us, in some aspects "there is not enough data...".

I also believe that several points linked to the developmental process of new surgical techniques must be meticulously considered and all the results make explicit to the surgical community.

Some of them are worthwhile to consider.

Do every surgeon have the same interpretation of the advances appearing in the literature?

In my experience, novel techniques with promising results in pioneer's hands are too rapidly taken as recommended

procedures that must be followed not to stand behind. As a consequence, proactive, enthusiastic but short-experienced surgeons, prematurely change the way they manage their patients. Urged by their impulse of progress and innovation they take what I call “Let’s try attitude” performing new procedures on patients without the necessary criteria and dexterity.

Innovators should be aware of this possibility of misinterpretation and clearly emphasize the limitations of their studies and remaining points not yet elucidated.

Are all comparisons between VATS and open chest procedures really valid?

The literature of the last two decades is plenty of publications on this comparison.

In my experience, the vast majority of these papers identify open procedures simply as “open thoracotomy”. All we know that several alternatives exist to open the chest.

In fact, well before the advent of VATS, a main topic in the literature was the management of pain associated to wide thoracotomies followed by the development of small-access-muscle-sparing thoracotomies.

Except cases with specific need to wide open the chest, the small-access-muscle-sparing has been our preferred method for open chest procedures in the last two decades. Moreover, the experience allowed us to develop a “new concept” chest retractor (Delacroix-Chevalier, Paris, France) to provide a conical surgical field with complete access to any intrathoracic structure through a 5 to 6 inches skin incision. A 3 to 4 days uneventful postoperative course usually follows these procedures and the patient is back to his/her normal activities in 2 weeks.

Authors should be aware of this data and when making comparisons with VATS, the chosen method used to open the chest should be described with the same detail as video-assisted technique is explained.

The conversion to open chest way out

Anybody can understand that innovators developing a new technique recur to open the chest when considering it necessary during a video-assisted procedure. They would be “venturing into the impossible, looking for the possible” as Arthur Clarke would say.

But it is also true that besides being a way to solve a problem, with the exception of unexpected situations,

having to abort a video-assisted procedure means a mistake in the indication of VATS that should be a prerogative reserved only for innovators.

Again, in my experience, this is a misunderstood situation.

Enthusiast surgeons, anxious to take the wave of innovation, instead of taking open conversion as a way to solve accidents or unexpected circumstances, they use it as a way of escape from the impossible and, what it is unacceptable, a safe way to indicate video-assisted surgery in doubtful patients.

It is possible that in the same way as some complications occur in patients that should have never had gone into the operating room, open chest conversions take place in some patients that should have had an open chest procedure from the beginning.

Is it reasonable to foresee that open chest surgery will disappear in the future?

Even after a much longer experience in using video, is not open abdominal surgery still practiced?

In trained hands, video-assisted techniques allow to perform not only complex but perform better some of them requiring high precision steps. Moreover, some procedures difficult to indicate as open chest are safely performed by video, as the exploration of traumatized chest or sympathectomy for hyperhidrosis.

But there are also situations, particularly in countries with less than optimal health care systems, where patients ask for medical assistance with their diseases in far advanced stages where the recommendations for VATS use are far exceeded.

Unfortunately this is not an uncommon situation in many parts of the world that usually comes along with the disposal of limited resources for medical and surgical assistance.

In those places, VATS is usually not available or underdeveloped and open chest surgery remains the first option.

Additionally, in my experience, is not infrequent that colleagues from the medical side erroneously take VATS as a less invasive procedure, appropriate for patients with advanced diseases and poor status performance.

In this scenario, all we need to get things worse, is an enthusiast but low experienced surgeon engaging in a prolonged and troublesome video-assisted procedure with high possibilities of intra or postoperative complications

and probably poor long term results.

In my view, every Thoracic Surgery Unit should be aware of the limitations to use VATS for the particular kind and stage of diseases they usually receive. At the same time, they should share with their medical colleagues the concept that VATS is not just a simpler procedure aimed to replace the aggressive open surgery of the past, and that by no means it is comparable to a video-cholecystectomy performed as ambulatory surgery.

Instead, VATS is a much less traumatic but sometimes more complex way to surgically treat thoracic diseases. Adequately indicated, allows obtaining excellent results, mild postoperative courses and a quick return to normal life.

Thoracic Surgical Units should also assume that “full posterolateral thoracotomy” is an old open thoracic approach with very rare indications today. That nowadays open chest surgery means a very small thoracic aperture of 5 to 6 inches skin incision, followed by minor or no muscle cutting at all and that new ad hoc chest retractors and instruments are available to make easier the surgeon’s work. These modern techniques for open chest surgery also markedly diminish surgical trauma and postoperative pain.

VATS vs. open chest in lung cancer surgical treatment

Although promising non-surgical alternatives for lung cancer treatment are slowly developing, surgery remains the main therapeutic resource, limited by the high incidence of cases first detected in advanced stages. Lung cancer screening programs appear to be an effective although insufficient way of overcome this problem.

Video-assisted surgery, initially considered not useful for surgical treatment of lung cancer, is now the preferred way to perform lobar and sublobar resection and even pneumonectomies. Uniportal VATS appears a valuable alternative perhaps more attractive to senior surgeons with their initial experience in open chest surgery.

Three specific areas related to lung cancer are important to consider.

Large size tumors

Although obviously there is no an accepted size from which to consider “big” a lung tumor, we all know what a big tumor is and the difficulties for its resection when indicated.

In my view, with the exception of cases treated as part

of a clinical trial, I cannot find a single reason to attempt a video-assisted resection of a big lung tumor, even under the “umbrella” of converting the procedure by opening the chest.

For a long time have been appearing in the literature, related to lung cancer or not, case reports of procedures showing that it was feasible to perform them by VATS but with no evidence whatsoever of any advantage (2). It appears to be a hidden message from the authors of those reports: “I was able to perform what nobody yet performed”.

I feel myself in need to emphasize the obvious. VATS practice should never be based on the same reason George Mallory expressed when asked why to climb Mount Everest. “Because it’s there”, he answered.

Sublobar resections

It is not anymore under discussion that it is technically feasible to perform a wedge resection of a visible lung lesion for anybody with some experience on VATS, neither it is controversial the feasibility of a segmentectomy in experienced hands. Less clear is the evidence of the medium and long term usefulness of those resections.

Literature has shown good results only in very small lesions (less than 20 mm), in patients with limited lung function and in lung resection for aged lung cancer patients (3). But for the cautious surgeon, it is easy to find in the literature that many limitations still exist ahead of technical feasibility: Intraparenchymal, not-visible lung nodules, lesions larger than 20 mm, lesions not clearly contained in an anatomic segment.

Additionally, is far too frequent that studies limit the follow up to immediate and short-term results. Powerful studies on cancer specific long-term survival after VATS resection are extremely necessary on lung cancer treatment.

The evidence of technical feasibility is not enough reason to perform, outside a clinical trial, video-assisted lung cancer resections, sometimes with additional measures like brachytherapy to prevent the well known possibility of local recurrence, on patients who have other therapeutics options like VATS lobectomy, small access muscle-sparing open lobectomy or even Stereotactic Body Radiation Therapy if necessary.

In my experience, some surgeons induce patients to erroneously correlate VATS limited lung resection with a light, short and safer procedure with identical results. To my knowledge, that sort of correlation has not been scientifically proved.

Lymphadenectomy

It is encouraging to verify that new medical products and tests for their correct use are continuously added to the oncologic armamentarium for adjuvant therapy of lung cancer.

But it is also recognized that a final pathological staging is of paramount importance for an adequate adjuvant therapy and that lymphadenectomy is a central part of that staging.

Is for that reason that it is widely accepted that a complete lymph node dissection must be added to any pulmonary resection for cancer of the lung and that it is also feasible to perform it by VATS.

Nevertheless, warning voices appear in the literature showing significant differences in nodal upstaging findings between open chest and VATS lymphadenectomies, associated or not to differences in overall survival (4).

In my opinion, this is just one of several well-known aspects related to lymphadenectomy appearing in the literature: Not all major lung resections have an adequate mediastinal dissection. Not all limited lung resection have an adequate hilar and mediastinal lymphadenectomy.

Although surely difficult to perform, we are obviously in need of a powerful study comparing identical resections and lymphadenectomies performed by VATS and open chest surgery which main end point should be long term cancer specific survival.

Do our young surgeons receive adequate training?

Much has been written and discussed about the need of a balanced training in general, cardiac and thoracic surgery in a reasonable short period of time.

Thoracic Surgery residents and fellows are usually familiar with video-assisted procedures from their previous training in general surgery. We should take advantage of this and focus our teaching efforts to obtain a balanced acquisition of knowledge, abilities and above all criteria for choosing between VATS or open chest as the best procedure, not only for lung resection but also for uncommon pathologies like those cases in need of a thoracoplasty, wide chest wall resections, huge lung tumors, extended pleural diseases and so on.

Again, opportunities to perform this kind of procedures are not the same all around the world. The incidence of these uncommon, late diagnosed diseases is higher in undeveloped countries and so is the need to apply procedures used in the

past, less used today but as useful as ever.

If we do not bring a really complete training; if we overemphasize in VATS use, at the end of training we will have a General Thoracic Surgeon pseudo-specialized and highly skilled in video-assisted surgery that is not necessarily bad although insufficient.

The main problem will be that in fact, we will have a Thoracic Surgeon unaware of his/her limitations in criteria and probably dexterity in nowadays open chest surgery.

If this happens, we will be far away from having accomplished the fourth steps of a complete learning process, attributed to Abraham Maslow. They run smoothly, as it is known, from the unconscious incompetence to the unconscious competence (5).

In conclusion

I want to leave a message of caution.

VATS is here to stay, to expand and to improve but we, experienced surgeons, along with innovators, should remain respectful of scientific method and above all, take special attention that our proposed new developments being correctly understood by the whole surgical community. If any, the limitations of those new proposals should make explicit. We should remember that when making comparisons, they are aimed not just to highlight the advantages of the innovation but to prove, through a scientifically valid process, that similar or better results can be obtained with the proposed technique. We must be cautious about the consistency or our training plans. They should provide our trainees with knowledge, abilities and criteria comprising the full spectrum of our specialty in addition to participate in the development of new techniques.

Above all, we must remain at all times respectful to the principle that, in medicine, everything must be done putting the interest of the patient first.

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Footnote

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References

1. Rocco G. Foreword. In: Tan L, Sihoe AD, Liu L, *et al.*, editors. *Uniportal Video-Assisted Thoracic Surgery*. Hong Kong: AME Publishing Company, 2015.
2. Lonie SJ, Ch'ng S, Alam NZ, *et al.* Minimally Invasive Tracheal Resection: Cervical Approach Plus Video-Assisted Thoracoscopic Surgery. *Ann Thorac Surg* 2015;100:2336-9.
3. Cattaneo SM, Park BJ, Wilton AS, *et al.* Use of video-assisted thoracic surgery for lobectomy in the elderly results in fewer complications. *Ann Thorac Surg* 2008;85:231-5; discussion 235-6.
4. Martin JT, Durbin EB, Chen L, *et al.* Nodal Upstaging During Lung Cancer Resection Is Associated With Surgical Approach. *Ann Thorac Surg* 2016;101:238-44; discussion 44-5.
5. Four stages of competence. Available online: <http://www.drillscience.com/dps/competence4stages.pdf>, accessed March 28th 2016.

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