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EDITORIAL COMMENT

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Which is the best approach for minimally invasive oesophagectomy?

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Minimally invasiveness in surgery for oesophageal cancer is common and is a routine part of general thoracic surgical practice. It represents an increasing component of the work load of many thoracic and upper-GI surgeons as demonstrated by the increase number of publications reported in PUBMED at 26 December 2020. Nineteen hundred sixty-three papers on minimally invasive oesophagectomy (MIE) were found, of those 123 (6.2%) were on hybrid oesophagectomy.

The invitation from the *European Journal of Cardio-Thoracic Surgery* provides an opportunity to briefly illustrate some existing, practical but very different minimally invasive surgical approaches to treat oesophageal cancer.

In this issue of the *European Journal of Cardiothoracic Surgery*, Giulini *et al.* [1] from Paracelsus University Nuremberg, Germany, make an important contribution to this subject in 2 ways: they add to our knowledge that there is no difference between hybrid robotic and hybrid laparoscopic oesophagectomy for cancer. Second, they conclude that hybrid robotic is feasible and safe in the treatment of oesophageal cancer. To make readers understand throughout the manuscript what is the hybrid approach in oesophageal cancer surgery, the following definition is presented herein: hybrid oesophageal surgery embraced a laparoscopic or robotic gastric mobilization and open thoracotomy.

Whenever a surgeon chooses an approach to operate on a patient with oesophageal cancer, the goal is to accomplish the same R0-resection, which should have been carried out via open approach. To achieve this goal, the 2 most important operative steps need to be followed: (i) perform an *en bloc* resection of the tumour and (ii) an extended lymphadenectomy (2 or 3 field). This insight, that the operation is more important than the approach, is not usually emphasized in the published studies, and it is not unusual that surgeons often describe their new approach as technically feasible and safe.

While reading the manuscript, some questions arise spontaneously.

Was the *en bloc* resection performed? The azygos arch/vein should be ideally included in the *en bloc* specimen as described by Skinner in 1983 [2]; instead Giulini *et al.* [1] accurately wrote that, although they performed a modification of the *en bloc* resection, a R0 resection was obtained in 42 of the 44 patients (95%) recruited in the case-matched analysis. This excellent result is similar to most MIE series which demonstrate high R0 resection rates (90–95%) when these procedures have been performed in highly specialized centres [3]. Another controversial topic that needs further expansion is that the results of the different MIE after neoadjuvant therapy with detailed data of loco-regional recurrence have not always been reported.

Looking with attention the central image of the manuscript it seems that authors still perform a large thoracotomy for the thoracic step of the operation. Another question arises. Is a large thoracotomy still necessary? Having recently used a hybrid approach, I preferred instead to perform a large thoracotomy a left video-assisted mini-thoracotomy of 10–12 cm. I should be disavowed but morbidity after MIE with a mini-thoracotomy is minimal, and the patients under Enhanced Recovery After Surgery (ERAS) protocol could be sent home earlier with less

complications. Moreover, thoracic surgeons are aware that left thoracic approach gives a better exposure of the hiatus and lower oesophagus. Nevertheless, I recall that the main reason why the left thoraco-abdominal approach has been abandoned is due to the study of Sasako *et al.* in 2006 [4]. The authors concluded that because left thoraco-abdominal approach does not improve survival and leads to increased morbidity the approach cannot be justified to treat these tumours. From my point of view, the conclusion of Sasako *et al.* [4] needs to be revised as a left thoracic approach via a video-assisted mini-thoracotomy (without the incision of the costal cartilage and circumferential opening of the diaphragm) could decrease morbidity. Certainly, further studies are encouraged.

What about lymphadenectomy? While Lerut *et al.* [5] have shown the importance of 2 or 3 field lymphadenectomy during open oesophagectomy, recently series demonstrated comparable or superior levels of lymph node retrieval between MIE versus open approach [6]. Robotic surgery allowed even a more extensive lymph node dissection, and R0 resection's rate was achieved from 94.7% to 97.5% [7]. The accuracy of detecting the positive lymph nodes, especially adjacent to the recurrent laryngeal nerve, could also be better performed using the approach in prone position or total MIE.

Another important point to discuss is the accurate preoperative and intraoperative evaluation of circumferential, proximal and distal dissection margin. Irrespective of the margin length, a positive margin is associated with poorer overall survival [8]. Certainly, without manual palpation, it is difficult to assess the intraoperative evaluation of the margins and complications such as airway involvement [9], but the use of fluorescence-guided surgery could be useful for example to achieve free resection margin. It should also be emphasized that adequate experience and surgeon volume [10] are fundamental not only to obtain negative margin but also to increase surgical quality.

The measure of long-term outcome is the most important point in cancer surgery, but none of the published series report any better long-term survival if hybrid, total laparoscopic or robotic surgery is used instead of the open approach. I am very pleased to be corrected but quality-of-life reporting in the evaluation of the outcomes of large thoracotomies is generally poor, and the unfavourable effect in terms of early postoperative breathing is usually well reported. Although total MIE has been demonstrated to be superior to hybrid oesophagectomy in regard of postoperative pain and pneumonia, a mini-thoracotomy instead of large thoracotomy could reduce postoperative complications with the hybrid approach.

Nevertheless, let us leave the surgical approach aside. Does hybrid oesophagectomy for oesophageal cancer improve survival? At this moment, it is not only awkward to answer but also arduous to expect a longer survival if the operation is the same than open approach. The preferred approach should not be based on personal experience alone but chosen on the approach that guarantees a better possibility of cure; current data are inadequate to announce the 'gold standard' surgical approach for oesophageal cancer, and therefore, it sounds justified that surgeons perform the approach that suit them best. It is also obvious that to endorse a different surgical approach, the improvement should not be only for ourselves, but the progress must be made unambiguous to the patient providing them robust data on efficacy, safety and long-term survival. Large global randomized trials are therefore necessary to clarify the ongoing uncertainty on the ideal minimally invasive approach to perform oesophagectomy for cancer.

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