We thank the editor for the opportunity to explain better the rationale for our recently proposed technique [1]. When many different procedures are described for the treatment of the same disease, it is clear that the ideal technique has not been identified yet.

In our opinion, the method devised by Actis Dato et al. [2] has a valid theoretical basis and has, in their hands, proved to be safe and effective. Furthermore, the authors have such a considerable experience in this field that their opinion has to be taken into the utmost consideration by the scientific community.

In conceiving our technique, we aimed to avoid some drawbacks associated with the use of metallic retrosternal bars while trying to maintain similar long-term results. In fact, a transverse posterior bar limits the thoracic compliance, causes exposures to serious damage in the case of trauma, can be painful and requires a second operation for removal. We think that such disadvantages may justify the research on novel methods. The use of new titanium plates specifically built for sternal stabilization avoids the need for a posterior support, while ensuring the same solidity of the reconstructed sternum. These results can be achieved thanks to the highest strength-to-weight ratio of titanium: the Synthes struts (Synthes®, Canada Ltd.) modelled on the anatomical sternal shape are so thin and light that their removal is not required. As correctly noted by Actis Dato et al., the procedure is relatively expensive [3]. This disadvantage is undoubtedly more than offset by the avoidance of a second surgery for the bar removal. Finally, the economic impact of the procedure is limited, as it is indicated in a carefully selected group of patients, with a condition difficult to correct such as the severe asymmetric pectus excavatum.

REFERENCES


LETTER TO THE EDITOR

Bilateral lobar lung transplantation and size mismatch by pTLC-ratio

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We read with great interest the important investigation by Inci et al. [1] on bilateral lobar lung transplantation (LTx). As a rationale, the authors cite that significantly oversized allografts are associated with perioperative complications and worse outcomes. The citation provided refers to a dog model of lobar LTx that compared allografts oversized on average 3.1-fold vs allografts that were similarly 3.3-fold oversized, but subsequently downsized 10–19% via peripheral wedge resections. At 4 h after LTx, the control group had higher pulmonary vascular resistance (PVR) and lower PaO₂ [2]. In a porcine model of lobar LTx, a 1.8-fold oversized allograft was compared with a size-matched allograft. That study reported a superior function with lower pulmonary artery pressures and lower PVR associated with the oversized allografts [3]. Neither animal model ideally reflects the clinical experience in humans. The human experience using significantly oversized lobar LTx with a 2.07-fold-oversized allograft was reported with good long-term outcomes [4]. Whereas there is evidence that (within surgically feasible limits) oversized allografts are not associated with worse clinical outcomes, there is evidence that significant undersizing could be problematic [5]. Donor-to-recipient lung-size mismatch is preferably assessed by the predicted total lung capacity (pTLC)-ratio (=donor pTLC/recipient pTLC) [5, 6]. In paediatric living lobar LTx, there is an association between undersizing (pTLC-ratio < 0.8) and worse survival [5]. Inci et al. focus on height difference between groups and the donor pTLC to recipient actual TLC difference. However, recipient actual TLC likely reflects the lung pathology more than the recipient's thorax size. Thus, it would be helpful, if Inci et al. could provide pTLC-ratio matching data for their cohorts. If, for example the pTLC-ratio of a conventional LTx is 1.25 (which should not be associated with worse clinical outcomes) and a lobar LTx leads to an actual pTLC-ratio of 0.75, one could expect that the very undersized situation created could lead to inferior clinical outcomes. Inci et al. report on a 39% occurrence of haemothorax. The association of undersizing (pTLC-ratio < 1.0)
with return to OR for bleeding, primary graft dysfunction, longer length of stay and increased resource utilization was reported [6]. Thus, it would be helpful, if more details on post-transplant complications between groups could be provided. The survival data, which are limited to an unadjusted Kaplan–Meier survival analysis comparing conventional with lobar LTx, make it difficult to interpret the results in context. The lobar LTx group consisted predominantly of patients with cystic fibrosis, who in general have the most favourable long-term survival. It would be informative if the authors could show analysis within the same diagnostic groups (i.e. cystic fibrosis). Furthermore, providing a multivariate Cox proportional hazard model adjusted for important confounders would strengthen the assessment of clinical outcomes.

We wish to conclude by thanking and congratulating Inci et al. on their important study on bilateral lobar LTx allowing life-saving transplants in ‘short’ recipients, who otherwise might not be able to receive an appropriately sized allograft in a timely way.

REFERENCES


LETTER TO THE EDITOR RESPONSE

Reply to Eberlein et al.

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We thank Eberlein et al. [1] for their interest in our article [2]. The purpose of our study [2] was not to show that oversized grafts are associated with more perioperative complications and worse outcome compared with standard lung transplantation. In our experience, oversized lung grafts can potentially lead to atelectasis and impaired airway clearance, which leads to a more complicated postoperative course [3]. Optimal size matching is therefore very important. For optimal size matching, different methods have been proposed, such as donor–recipient difference or ratio of body weight and height [4, 5]. In addition, chest circumference and chest x-ray vertical and transverse dimensions have been used [4]. Others have used donor and recipient total lung capacity (TLC) [4, 5]. Interestingly, a recent US study showed that overall post-transplant survival or lung function after standard lung transplantation was unaffected by donor-to-recipient predicted TLC ratio and actual TLC ratio [6]. We also calculated donor-predicted TLC/recipient-predicted TLC ratio (pTLC ratio) (Data not given in original article [2]). Median pTLC ratio was 1.5 (range, 0.84–2.44). In only one recipient this ratio was 0.84 and in all other 22 recipients, more than 1. In addition, there is a very significant correlation between pTLC ratio and donor-recipient height difference ($r = 0.903$, $P = 0.01$, Pearson correlation test) and also between pTLC ratio and percentage of donor-recipient height discrepancy ($r = 0.924$, $P = 0.01$, Pearson correlation test). According to these data, it is also possible and reliable to decide size mismatch with donor-recipient height difference. We reported a rate of 39% haemothorax requiring reoperation [2]. Nineteen (83%) of the transplantations were performed with extracorporeal membrane oxygenation (ECMO) support. Three recipients were on ECMO preoperatively as a bridge to transplantation. This can explain the rate of haemothorax requiring intervention. Detailed information is given in our paper [2]. Our lobar transplant group are not predominately cystic fibrosis (CF) patients ($n = 10$). The number of idiopathic pulmonary fibrosis patients is 8 and nearly equal to CF recipients.

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