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Correspondence

Letter to the Editor



Dear Editor:

In their very interesting paper “Complications and trends in minimally invasive repair of pectus excavatum: A large volume, single institution experience” by Dr. Michelle Torre et al. [1] there are some aspects that deserves comments. The authors have highlighted the potential for complications of the technique, especially in relation to cardiac / pericardial injury, the most feared complication of the procedure.

They have divided the analysis of the series in two phases, demonstrating that in the initial phase (266 cases) there were 12 pericardial lesions and in the second phase (334 cases) there was none. They also have pointed out that in the initial phase MIRPE was performed by surgeon A assisted by surgeon B. In the second phase, surgeon B became the main surgeon. Recently, two other surgeons started to perform the technique, but always assisted by surgeon B. The authors warn of the importance that the learning curve has as a way to avoid these complications. It is unquestionable that in centers with a large volume of MIRPE, and where experienced surgeons can participate in all procedures, this is an effective way to avoid complications. However, this is not a solution for most pediatric and thoracic surgeons who perform MIRPE and who do not work in referral centers.

We are aware that some technical modifications that aim to reduce the risk of pericardial injury during the dissection of the retrosternal tunnel, and that do not require specific equipment, have already been reported [2,3]. In this sense, it would be convenient to describe the technique that we have been using as a routine in our Service to avoid cardiac damage during retrosternal tunnel dissection.

The first point is that, whenever possible, the Crane maneuver should be performed not only to dissect the retrosternal tunnel but it must be maintained throughout the procedure [4]. But regardless of Crane's maneuver, our routine has always been to start dissecting the retrosternal tunnel from the left side. And for doing so, instead of using the pectus introducer - a dedicated tool developed to create the tunnel - we have been creating the retrosternal tunnel with habitual, preferably bi-articulated instruments, like those utilized in video assisted surgeries [5].

The reason for not using the pectus introducer is that MIRPE is not a common surgery and just a few surgeons (except those in referral centers) operate pectus regularly to the point of becoming skilled with the pectus introducer. This is a long instrument

(58.6 cm) and in unskillful hands it can behave like a dangerous lever in a very narrow anatomical space, that is the retrosternal region.

The rationale for starting the tunnel dissection on the left side is that in pectus cases the heart is dislodged to the left [6], and in this situation making the retrosternal tunnel dissection from the right to the left hemithorax seems illogical. Thus, starting the dissection on the left side, working over the pericardium, is safer than dissecting on the right side and coming against the heart.

Although these modifications may sound irrelevant to experts' surgeons, our practice tutoring less experienced surgeons in MIRPE, has shown that they clearly prefer to create the retrosternal tunnel with this technique because they feel safer. Once again, Torre et al. should be congratulated for sharing their vast experience addressing such relevant aspects of MIRPE.

References

- [1] Torre M, Guerriero V, Wong MCY, Palo F, Lena F, Mattioli G. Complications and trends in minimally invasive repair of pectus excavatum: a large volume, single institution experience. *J Pediatr Surg* 2020 S0022-3468(20)30859-9. doi:10.1016/j.jpedsurg.2020.11.027.
- [2] Johnson WR, Fedor D, Singhal S. A novel approach to eliminate cardiac perforation in the nuss procedure. *Ann Thorac Surg* 2013;95(3):1109–11. doi:10.1016/j.athoracsur.2012.10.016.
- [3] Gould JL, Sharp RJ, Peter SD, Snyder CL, Juang D, Aguayo P, Fraser JD, Holcomb GW 3rd. The minimally invasive repair of pectus excavatum using a subxiphoid incision. *Eur J Pediatr Surg* 2017;27(1):2–6 Feb. doi:10.1055/s-0036-1587585.
- [4] Park HJ, Chung WJ, Lee IS, Kim KT. Mechanism of bar displacement and corresponding bar fixation techniques in minimally invasive repair of pectus excavatum. *J Pediatr Surg* 2008;43(1):74–8 Jan. doi:10.1016/j.jpedsurg.2007.09.022.
- [5] Tedde ML, Togoro SY, Eisinger RS, Okumura EM, Fernandes A, Pêgo-Fernandes PM, Campos JRM. Back to the future: a case series of minimally invasive repair of pectus excavatum with regular instruments. *J Bras Pneumol* 2019;45(1):e20170373. doi:10.1590/1806-3713/e20170373.
- [6] Jang YE, Park JB, Kang CH, Park S, Kim EH, Lee JH, Kim HS, Kim JT. Cardiopulmonary resuscitation in pediatric pectus excavatum patients-where is the heart? *Paediatr Anaesth* 2020;30(6):698–707 Jun. doi:10.1111/pan.13878.

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