

## Peer Review File

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### Review Comments

#### Reviewer A

Thank you for taking on this difficult repair. It is not easy to come up with an agreement on one perfect repair, due to the anatomy and associate lesions. This is a great way to some patients if you have the resources to do so.

Reply: I'm totally agree. Thanks for your considerations.

#### Reviewer B

Thank you for submitting very interesting cases for JTD. But there are some grammar errors to fix. Please check it thoroughly and correct it. For example, the word 'protected' should be changed to 'protect' in the abstract. The authors should check grammar and correct tense agreement. There are many awkward parts in the composition of the paragraphs. In particular, the last paragraph of the discussion seems to need a lot of revision.

Reply: The word 'protected' has already been changed to 'protect' in the abstract. Grammar checked.

#### Reviewer C

Please introduce the “old” technique and give an overview of methods published in the literature.

What was the indication for follow-up ct scans in children?

Reply: The CT scans were indicated because of the lack of DATA about the pericardium and vitagraft in sternal cleft reconstruction. Until this manuscript, we did not know anything about biocompatibility, reabsorption, and local complications.

Could ultrasound be useful?

Reply: In general, I think the ultrasound can add information about local complications, especially in case of fluid accumulation under skin or the prosthesis. On the other hand, the ultrasound could not add information about biocompatibility, prosthesis, and chondral graft reabsorption.

What is the idea of cartilage resection?

Reply: The cartilage resection can make the approximation of the sternal bars and provides the chondral grafts, also a rigid material used to reinforce the neosternum.

#### Reviewer D

This paper is a case series of 3 patients undergoing sternal cleft repair with the creation of a posterior sternal wall with bovine pericardium, placement of chondral grafts and interrupted PDS sutures to approximate the sternal bars, and an overlying pericardial patch when the pectoralis major cannot be reapproximated. The authors should be commended on their excellent outcomes on a rare condition where there is a paucity of literature.

I have a number of recommendations and questions regarding the paper.

#1) This paper needs some significant editing and review by someone fluent in scientific English language writing. To help, I've noted the lines with grammatical

and proof-reading errors, they were too many to specify what was wrong on each line – line 12, line 21, 26, 33, 36, 39, 46, 53, 54, 58, 60, 78, 81, 84, 99, 108, 114, 115, 116, 130, 137, 142, 144, 151, 152, 154, 155, 156, 157

#2) Line 44: Not sure what “how to lead” means here. Do you mean “how to manage”?

Reply: Yes, already corrected

#3) Line 83: Instead of evolution do you mean resolution?

Reply: No, but already correct

#4) Line 87: Can you clarify what it means that the upper part of the new sternum seems like manubrium?

Reply: I mean the superior part of the prosternum (reconstructed with the chondral grafts) seems like an original manubrium.

#5) Line 99 should have a citation.

Reply: Ok

#6) Line 104 – Do you mean “We PREFER to close primarily”?

Reply: Corrected

#7) Line 106 – Not sure drawbacks is the word you want to use here – maybe the word you want is challenges

Reply: Corrected

#8) Lines 123-134 – this seems like a completely different discussion. It should either be reported separately or there should be the same level of detail of the case as the other cases presented (comorbidities, length of follow up, etc.) When do you use Vitagraft?

Reply: The previous steps such as the vertical incision in the periosteum of sternal bars, medial rotation, and chondrectomy are all the same. The difference is the Vitagraft<sup>□</sup> placement between the sternal bars. Also corrected in the manuscript.

#9) Line 146 – Are you saying you did not see acquired Jeune’s syndrome?

Reply: Yes, we did not face any case. I think it is probably due to the chest enlargement.

#10) Can you discuss when you choose to use this approach versus doing a primary closure? My impression is that it is your preference to do primary closure, but this wasn’t entirely clear. You allude to the age and lack of chest flexibility being a factor, but other reports have described primary closure in patients of similar or older age.

Reply: Our impression is that the suture without any materials is performed with too much tension. That’s why we suggest the pericardium and the Vitagraft

#11) I’d like some additional details on the operation. Specifically, do you resect the thymus to make room if you’re attempting primary closure before using your PSW bovine pericardium technique?

Reply: No, we did not associate any kind of visceral resections in this case.

#12) Did you routinely get chest CTs on patients post-operatively?

Reply: No, it is not a routine unless something calls our attention.

#13) The main innovation and change here appears to be the utilization of bovine pericardium instead of polypropylene mesh which the group had previously used. Can you clarify what the benefit of using the bovine pericardium was over using

polypropylene mesh? Were there complications specific to polypropylene mesh that were not seen with bovine pericardium?

Reply: We believe the pericardium is better because we avoid synthetic materials, much more biocompatible, and easily handled. De Campos J.R. M, with one of the largest experiences in the literature with fifteen cases, did not mention any specific mesh complication. But also highlights the risks of infection and the inability of these inert materials to remodel as to the patient growths.

#14) Your paper makes it seem that one of the innovations was to place suction drains above and below the muscle plane. Were you not placing drains previously?

Reply: Drains were generally placed anterior to the muscle, that's why we suggest above and below placement.

In summary, I think the paper does have some novel description of utilizing a modification to close sternal clefts with bovine pericardium for the posterior sternal wall, some additional sutures to keep the chondral grafts in place, an additional bovine pericardial patch if muscle approximation is not feasible, and suction drains above and below the muscle. This is a fairly rare disease with only small case reports and series and reviews published. I commend the authors for their improvement of their technique and their excellent outcomes.

Reply: I really appreciate your comments, changes in the surgical technique of such a rare disease are always welcome.

#### **Reviewer E**

thank you for this interesting article which corresponds to the last patients operated by the Sao Paulo team in Brazil.

You describe new options (bovine pericardial patch and vita graft) to cure and stabilize sternal cleft (SC). You have probably one of the biggest world experience of the problem and your article shows that you master the subject.

minor questions:

1) some articles mention a symptomatic thoracic retraction after the cure, do you experiment with such a problem? just tell it, yes or not, for the next reviews.

Reply: Great question. Literature has already mentioned the retraction similar to the "acquired jeune". We did face any case like this, probably as a consequence of our technique as we enlarged the diameter of the chest.

2) I don't have found in the references or in literature another experience of vitagraft, do you know other publications on the subject? If yes, note it.

Reply: The Vitagraft is widely used in orthopedic surgery, but not in thoracic, I mean regarding chest wall reconstruction. That's my first experience.

3) Do you know if Vitagraft can be cut or should be removed for the next surgery? yes or not, just note it, please.

Reply: The Vitagraft can be tailor-made at the procedure, so it can be cut during the procedure for the required shape. We do not still face any redo surgery in case of sternal cleft because the surgery is mainly indicated after careful cardiac assessment.