A new approach for sternotomy incision - a possibility for improved sternal wound healing

The median sternotomy was first advocated as a surgical incision by Milton in 1897, but the median sternotomy was not popularized until about 60 yr later by Julian and co-workers\(^1\). This incision provides excellent exposure of the heart and mediastinal structures without the pain and morbidity associated with the bilateral anterior thoracotomy\(^2\) and due to the expansion of modern cardiac surgery the median sternotomy has become one of the most frequently used incisions in major surgical procedures\(^3\). However, the sternotomy is also associated with dehiscence and instability resulting in delayed sternal healing and increased risk of poststernotomy mediastinitis\(^4\). Poststernotomy mediastinitis is one of the most feared complications in patients undergoing cardiac surgery. With modern hospital hygiene standards, and the use of prophylactic antibiotics, the overall incidence of poststernotomy mediastinitis is reported to be low, usually between 1 and 3 per cent\(^5,6\). However, this complication is associated with a significant mortality, reported to vary between 10 and 35 per cent\(^7,8\). Risk factors for developing poststernotomy mediastinitis, such as high body mass index and diabetes mellitus, have been described previously\(^6,9\) and since several of these risk factors tend to increase there is a growing number of patients at “high-risk” for sternal complications. Even if recent innovations in wound healing have been proved to be effective\(^10\) the intention must be to prevent and not to cure this potentially lethal complication.

Several reports have been published in recent years in order to improve the results after median sternotomy. However, these studies have focused mainly on techniques including stainless steel wires and rigid fixation plates\(^11,12\). In the study by Madan and colleagues in this issue\(^13\), the attention is drawn towards the sternal incision itself while using the interlocking sternotomy incision. This curvilinear, paramedian sternotomy incision has been described previously by others\(^14,15\). This group has previously reported their successful experience with the interlocking sternotomy\(^16\). In the present study, Madan and coworkers demonstrate less pain presented as lower visual analogue scale (VAS) score at discharge and at one month follow up in patients undergoing the interlocking technique. Further, patients with interlocking sternotomy had better peak expiratory flow values in the immediate post-operative phase when compared to conventional straight sternotomy. The clinical significance of these findings is difficult to interpret, but it may enable early mobilization.

There are obvious limitations in the present study, as mentioned by the authors themselves, such as the small sample size and a limited follow up period. Furthermore, the exclusion of patients with risk factors for poor wound healing makes the results less applicable in a wider perspective. Another question is whether the No. 5 stainless steel sutures used in the straight sternotomy group would be sufficient in a western population including high BMI patients. However, the present study is innovative and valuable as a prospective and randomized pilot study. The interlocking procedure at least theoretically, adopts more to established orthopaedic principles and it also puts its finger on the importance of proper alignment when closing the sternum. The previously mentioned limitations, including variations in surgical procedures, preclude definitive conclusions.
regarding the superiority of interlocking sternotomy. However, this attempt to evaluate a cheap, reproducible technique for improving sternal wound healing certainly fills its needs. Further studies are required to establish the indication for this sternal incision, especially in the perspective of preventing poststernotomy mediastinitis.

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References


