Abstract

Background: Minimally invasive pectus excavatum repair is a painful surgical procedure and the postoperative pain is difficult to control. There is an increased risk associated with inserting an epidural catheter. Preventing this complication requires an accurate prediction of the depth of the epidural space in the thoracic level. However, this has so far been predicted at the lumbar level or low and middle thoracic levels. The objective of this study was to determine the prediction of the depth of the epidural space at the middle thoracic level for pectus excavatum repair in children.

Methods: Thirty-eight children, ASA score I-II, were included in this prospective observational study. An epidural catheter was inserted in the lateral position by median approach with the patients under general anesthesia or awake. The distance between skin and epidural space was measured at the thoracic level. The patients were divided into two groups according to their age (Group 1: from 5 to 14 years old, Group 2: from 14 to 19 years old). This division of the groups based on the growth of the human vertebral body height. The Spearman correlation between body weight and the depth of the epidural space was 0.85 in group 1. In addition, there was correlation between age and the depth of the epidural space.

Results: There were no complication during the perioperative period in this study. Effective analgesia for operative and postoperative pain is difficult to control. There is an increased risk associated with inserting an epidural catheter.

Conclusion: These results showed that there was correlation between age as well as body weight and the depth of the thoracic epidural space in children. An epidural catheter was inserted in the lateral position by median approach with the patients under general anesthesia or awake. The distance between skin and epidural space was measured at the thoracic level. The patients were divided into two groups according to their age (Group 1: from 5 to 14 years old, Group 2: from 14 to 19 years old). This division of the groups based on the growth of the human vertebral body height. The Spearman correlation between body weight and the depth of the epidural space was 0.85 in group 1. In addition, there was correlation between age and the depth of the epidural space.

<The predict formula>

The predict formula of the distance from the skin to epidural space was as below. Group 1: $\text{Depth} = 0.07 \times \text{Age} + 1.16$ $\text{Depth} = 0.2 \times \text{Age} + 1.1$ $\text{Depth} = 0.0693 \times \text{BW} + 1.166$ $\text{Depth} = 0.07 \times \text{Age} + 1.2$

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