Abnormality of Aortic Arch Branching in a Thai Embalmed Cadavers and its Clinical Application: A Rare Case Report

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Background and Objective: In normal development, the aortic arch (AA) gives 3 major branches: 1) Brachiocephalic trunk, 2) Left common carotid artery, and 3) Left subclavian artery. The abnormality of those AA branching is important for thoracic surgery consideration. Although the abnormality of aortic arch branching has been reported in some races, this abnormality in Thai cadavers has never been investigated previously.

Method: Dissections in this study were performed in Thai embalmed cadavers during teaching gross anatomy for Medical students of Ubon Ratchathani university. The cadavers were carefully dissected thoracic region to investigate the anatomical structures of AA branching. This study was carried out from 10 female and 12 male cadavers.
ผลการศึกษา: จากว่าผลจากการศึกษาในจำนวน 22 ร่างได้สังเกตพบว่ามีความผิดปกติของ left vertebral artery ในร่างของอาจารย์ใหญ่เพศชายที่มีอายุ 58 ปี (คิดเป็นร้อยละ 4.55) โดยจะมีความผิดปกตินี้ได้มาจากข้อมูลจาก AA บริเวณที่อยู่ระหว่าง left common carotid artery และ left subclavian artery โดยมีความผิดปกตินี้สามารถสังเกตเห็นได้อย่างชัดเจน

สรุป: จากการวิเคราะห์ข้อมูลที่ได้สังเกตจาก 22 ร่างมักจะพบว่ามีความผิดปกติของ vertebra artery ซึ่งมีความสำคัญในการพิจารณาการกระทำของแพทย์ที่มีความผิดปกตินี้จะส่งผลต่อการกระทำของการทำ angiography ของแพทย์

ค่าสำคัญ: ความผิดปกติของ artery aortic arch,
ently, the LVA branches from the upper ridge curve of the AA to supply the ventral surface of pons and the medulla oblongata. We observed that the left vertebral artery is located in a false position which was found to arise between the LCCA and the LSA as shown in Figure1. The LSA branches from the top ridge of AA and runs to supply the left upper limb. In morphometric study using a transverse plane measurement at the same level, the diameters of the BCT, LCCA, LVA, and LSA were approximately 15.14, 5.81, 4.34, and 6.99 millimeters, respectively.

Discussion

The abnormalities of the AA of human subjects have been documented in many countries including Nepal, Germany, India, U.S.A., China, Iran, and Jordan. The incidences of such AA variation were 2.0, 4.2, 14.66, 34, 33.5, 16.2, 0.9, and 38.8%, respectively\(^7,10,12,13,15-17\). In this recent study in Thais, we have only observed the AA abnormality in one male case (4.54%), which is similar to that finding in a male in Singaporean\(^5\) and in Japanese\(^19\). In Chinese, the incidence of this AA abnormality was frequently found often in females\(^17\). The pattern of aortic branching abnormality found in our case was found at the position of the left vertebral artery branch as it directly arises from the aortic arch. The left vertebral artery branch was found between LCCA and LSA. It originates directly from AA between LCCA and LSA. This observation is similar to that from many previous studies\(^5,6,12,14,15,17\). In the literatures, various studies have been conducted to investigate the abnormalities of the AA in terms of extra branches\(^5,6,11\), fewer branches\(^7,12,13\), and false positions of the branches from the aortic arch\(^5,6,13,14\). In clinical significance, all findings from previous studies are useful and important for assisting surgeons to diagnose correctly regarding operations of thoracic and neck vessels\(^10\). Additionally, it is also essential for thoraco-cervical aortic surgery\(^7\). Especially, this variant information is may be used for first reconsideration to avoid the misinterpretation before inserting aortic instrumentation into the branches of the AA under angiograph.

Conclusion

This variant information gained from our observation can be used for the first reconsideration to avoid the misinterpretation before inserting aortic instrumentation into the branches of the aortic arch under angiograph.

References


