Prevalence of foramen arcuale and its clinical significance: A meta-analysis of 55,985 subjects

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Abstract

The FA is a commonly present anatomical structure. Awareness of a complete variant of the FA during procedures performed on the atlas vertebra is essential in reducing the risk of iatrogenic injury. Therefore, risk for the presence of an FA should be considered by surgeons prior to procedures on the atlas in each patient according to gender and ethnic group. As such, we highly advise preoperative screening with CT as the gold standard for finding the presence of an FA.

Results: A total of 127 studies (n=55,985 subjects) were included into the quantitative analysis. The overall pooled prevalence of a complete FA was 9.1% (95%CI: 8.2–10.1), while the overall pooled prevalence of an incomplete FA was 13.6% (95%CI: 11.2–16.2). The complete FA was found to be most prevalent in North American (11.3%) and European (11.2%) populations, and least prevalent among Asian (7.5%) populations, especially Chinese (4.4%) and South Koreans (5.8%). In the presence of a complete FA, a contralateral FA (complete or incomplete) was found in 53.1% of cases.

Conclusion: The FA is a commonly present anatomical structure. Awareness of a complete variant of the FA during procedures performed on the atlas vertebra is essential in reducing the risk of iatrogenic injury. Therefore, risk for the presence of an FA should be considered by surgeons prior to procedures on the atlas in each patient according to gender and ethnic group. As such, we highly advise preoperative screening with CT as the gold standard for finding the presence of an FA.

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