

Radiological Study of the Ethmoidal Arteries in the Nasal Cavity and Its Pertinence to the Endoscopic Surgeon

Jasmine P. Y. Kho¹  · Ing Ping Tang² · Kia Sing Tan³ · Ai Jiun Koa³ · Narayanan Prepageran¹ · Raman Rajagopalan¹

Received: 18 May 2018 / Accepted: 28 May 2018
© Association of Otolaryngologists of India 2018

Abstract We studied the ethmoidal arteries using preexisting computer tomography of the paranasal sinuses (CT PNS) and statistically scrutinized data obtained between genders. A descriptive study from 77 CT PNS dated January 2016–December 2016 were collected and reviewed by two radiologists. A total of 54 (108 sides) CT PNS were studied of patients aged 18–77 years. 37 are male, 17 are female; with Bumiputera Sarawak predominance of 25 patients, 12 Malays, 16 Chinese and one Indian. Rate of identification are as follows: anterior ethmoidal artery (AEA)-100%, middle ethmoidal artery (MEA)-30%, posterior ethmoidal artery (PEA)-86%. The average distance from AEA–MEA is 8.1 ± 1.52 mm, MEA–PEA is 5.5 ± 1.29 mm and AEA–PEA is 12.9 ± 1.27 mm. The mean distance from PEA–the anterior wall of sphenoid is 7.7 ± 3.96 mm, and PEA–optic canal is 8.5 ± 3.1 mm with no statistical difference when compared between gender. AEA frequently presented with a long mesentery 57.4%, while 87.1% of PEA was hidden in a bony canal. The vertical distance of the AEA–skull base ranges from 0

to 12.5 mm whilst PEA–skull base is 0–4.7 mm. There is no statistical difference in distances of AEA, MEA nor PEA to skull base when analyzed between genders; $t(82) = 1.663$, $p > 0.05$, $t(32) = 0.403$, $p > 0.05$ and $t(75) = 1.333$, $p > 0.05$ respectively. We newly discovered, that 50% of MEA is hidden in a bony canal, and its distance to skull base ranged 0–5.3 mm. MEA and PEA less commonly have a short or long mesentery. Knowledge on the ethmoidal arteries especially in our unstudied population of diverse ethnicity, gains to assist surgeons worldwide, when embarking in endoscopic transnasal surgeries.

Keywords Computer tomography · Paranasal sinuses · Ethmoidal arteries

Introduction

Caldwell [1] first described radiology of the paranasal sinuses (PNS) in the 1900s. Since then, CT PNS (Computer tomography of paranasal sinuses) has aided clinicians and surgeons alike in establishing diagnosis and treatment. The ethmoidal arteries which arise from the ophthalmic arteries, are important anatomical landmarks in endoscopic transnasal surgeries to critical structures such as the optic nerve and skull base [2]. However, the middle ethmoidal artery (MEA) has not been well studied. We set out to study the ethmoidal arteries amongst our multi-diverse ethnic population, attempting to identify any differences from Caucasian data. We also analyzed the data, to see if any differences existed when comparing a male to a female patient. We aim to correlate radiological features to assist surgeons, when planning for endoscopic transnasal surgeries and ultimately reduce perioperative complications.

✉ Jasmine P. Y. Kho
dr.kho.m.d@gmail.com

¹ Department of ENT, University Malaya Medical Centre, Kuala Lumpur, Malaysia
² ORL-HNS Department, Faculty of Medicine and Health Sciences, University Malaysia Sarawak, Kota Samarahan, Sarawak, Malaysia
³ Department of Radiology, Hospital Umum Sarawak, Kuching, Sarawak, Malaysia