The different positions of orientation of the ophthalmic artery in relation to the optic nerve.

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Introduction

The anatomy of the orbital region is of great importance for multiple specialty disciplines[1]. The orbital region is complex with a range of variations some of which may be congenital, while others may develop later in life due to pathologies which may arise from certain disease conditions [2,3,4]. The ophthalmic artery (OA) is the main source of blood supply to the orbit and is the first branch of the 6th segment of the internal carotid artery (ICA) after its emergence from the cavernous sinus[2].

Knowledge of the OA origin and its orientation in course in relation to the optic nerve (ON) is paramount for surgeons working in the orbital region.

This paper aims to report and highlight the different points of OA course orientation in relation to the ON.

Materials and methods

A total of 69 human cadavers were dissected through exenteration. In the dissection hall in the Department of Human Biology, University of Cape Town. The sample consisted of full-term fetuses and adults (22 to 100 years old) and were of both the male and female sex.
The intra-orbital part of the OA was dissected and studied from its point of origin at the ICA. The orientation in course of the OA in relation to the ON was recorded. Both the left and right orbits were compared in all individuals. Digital photographs taken and data sheets used to record the results.

Ethical approval was granted for the study with reference: 469/2018.

The schematic representation in figure 1 was used to further illustrate the positions of the OA in relation to the ON.

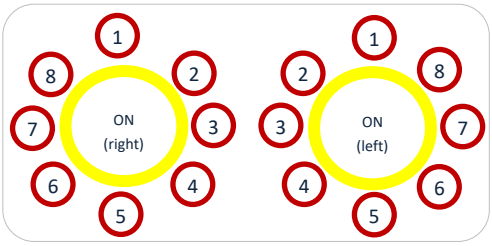

Figure 1: Positions of the OA in relation to the ON. (ON = optic nerve, 1 = superior, 2 = superomedial, 3 = medial, 4 = inferomedial, 5 = inferior, 6 = inferolateral, 7 = lateral, 8 = superolateral.

Results

All the bodies were included in the study and the results were as shown in table 1.

Table 1: The orientation course of the OA in relation to the ON.

OA orientation	Left (n)	Right (n)	Frequency (%)
Superior	11	10	30.4
Superomedial	9	3	17.4
Medial	1	10	15.9
Inferomedial	4	3	10.1
Inferior	4	6	14.5
Inferolateral	1	0	1.4
Lateral	0	2	2.9
Superolateral	7	3	14.5

In a few cases it was noted that the same orientation was seen in both eyes of the same individual, but in some individuals the orientation was different.
In figure 2 is an example of the two eyes from one individual where the OA orientation in the right eye was superolateral and medial in the left eye.

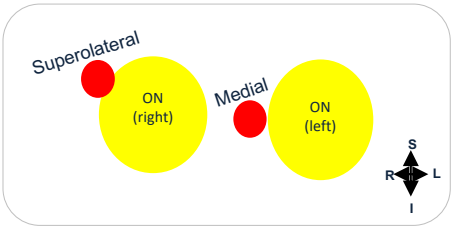

Figure 2: The OA orientation position in relation the ON in both orbits. (ON = optic nerve, S = superior, L = left, I = inferior, R = right).

Discussion and conclusions

The OA usually enters the orbit either inferiorly or inferomedially in relation to the ON in about 30% of people [6]. In the current study, the inferior orientation course was seen in 14.5% and inferomedial in 10.1%.
The superior orientation course was seen to be 30.4%. The lowest frequency in orientation in the current study was the inferolateral course (1.4%).
The reason for differences in the orientation of OA course in relation to the ON could be due to the anomalous development of the OA.

In conclusion, the OA is a structure with high variations. The results were independent and could mainly be explained through the human variation as statistical analysis showed that there were no links with age and sex.

References

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