Extraoral Ligature of Lingual Artery: Anatomic and Topographic Study

Ligadura Extraoral de la Arteria Lingual: Estudio Anatómico y Topográfico

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SUMMARY: The lingual artery constitutes one of the branches of the external carotid artery, which is responsible for the vascularization of the tongue and neighbour regions. The hemorrhage caused by a lesion of the lingual artery can occur during a dental procedure (surgical accidents by the use of an instrument or rotating disc), by trauma, biopsy and dental implant. In some cases is difficult to stop the hemorrhage of injured vessel, so is necessary to realize the extraoral ligature of this artery. Hence, this work studied the anatomic aspects of the lingual artery, by forty-eight dissections of twenty-four corpses settled in formol 10%, aiming to detail the origin, pathway and anatomic relations of the lingual artery in the region of anterior trigone of the neck, and also to measure the distances among the lingual artery and the arteries: facial, superior thyroid and with the bifurcation of the common carotid. The results concluded that the lingual artery is found in a position more inferior than classically described, based on the digastric muscle and the hypoglossal nerve; and that the hyoid bone can be used as a point of reference for the surgical access to the lingual artery in the region of the anterior trigone of the neck.

KEY WORDS: Lingual artery; Linguofacial trunk; Tongue; Irrigation.

INTRODUCTION

The purpose of this study is to provide more information concerning about the origin, pathway and anatomic relations of the lingual artery in the region of the anterior trigone of the neck and also to measure the distances among the origin of this vessel and facial and superior thyroid arteries and with the bifurcation of the common carotid artery aiming to characterize and to compare these distances, observing the presence or not of asymmetry, in order to auxiliate the general and bucomaxillofacial surgeons in the access of this artery.

MATERIAL AND METHOD

In this study were used 24 corpses of male sex adults, settled in formol 10% from the Departamento de Anatomia do Centro de Ciências Biológicas da Universidade Federal de Pernambuco. The technic used was the convenience...
Using the Test t of Student (Table I) it was not observed a significant difference \( p \leq 0.05 \) among the pairs of the average of the distances between the origins of the lingual artery with the facial artery and the superior thyroid artery of both sides. However, the result was significant between the average of the distances of the origin of the lingual artery with the bifurcation of the common carotid artery of both sides \( p = 0.008 \).

**DISCUSSION**

The best way of control the lingual hemorrhages is to act directly in the bleeding region. If the bleeding was not controlled, the procedure consists of the extraoral ligation of the lingual artery for the suitable control of the intraoral hemorrhage Kruger and Bavitz et al.

In the study of the lingual artery in the anterior trigone region of the neck, the presence of the linguofacial trunk observed in our survey are partially according to the studies of Basmajian (1993); Shangkuan et al. (1998) and Shima et al. (1998) which...
realized dissections in corpse and obtained results similar among them and our results. In the observation of the presence of the linguofacial trunk Basmajian related that in two hundred and eleven cases, 20% showed the trunk; Shangkuan et al., observed that in twenty-five cases, 20% showed the trunk and Shima et al., described that in thirty cases, 21.7% showed the trunk.

From the works found in the literature only Moore (1994) related that the lingual artery is found 5mm above the extremity of the greater horn of the hyoid bone and Homze et al. (1997), 6.3 mm above it; which are similar to our results.

The hypoglossal nerve constitutes an important anatomic structure that is related to the lingual artery. It was observed that in 72.92% of the cases the artery was inferior to the nerve, 12.50% on the nerve and 14.58% superior to it. In the literature Snell (1984); Woodburne (1984); Garder et al. (1988); Basmajian and Moore described that the hypoglossal nerve crosses superficially the lingual artery; and only Homze et al., allowed to improve the study about the hypoglossal nerve and the lingual artery observing that in 84.6% of the cases the artery was inferior to the nerve, 11% on the nerve and 4.4% superior to it, which are very similar to our results.

Concerning about the measurement of the distances among the origin of the lingual artery and the other arteries, it were not found data in the literature which could improve the discussion with our results.

Using the Test t of Student it was observed that among the pairs of the average between the origin of the lingual artery with the facial artery and the superior thyroid artery of both sides not showed a significant difference (p ≤ 0.05), however, the average of the distances of the origin of the lingual artery with the bifurcation of the common carotid artery was significant p = 0.008, what indicates that on the left side the lingual artery is more inferior than on the right side.
Using the Coefficient of Correlation of Pearson, the distances among the origin of the lingual artery and the bifurcation of right common carotid and the distance of the origins of the lingual artery and the right facial artery was obtained a negative correlation, when one of the distances increases the other decreases. Concerning about the distances of the origins among the lingual artery and left facial artery with the right, it was observed a close relation and in the correlations among the distances of the origin of the lingual artery and the bifurcation of the left common carotid with the distance of the origin of the lingual artery and left facial artery it was not observed a relation.

Based on our results we concluded that:
1. The lingual artery often has its origin in the external carotid artery and also in the linguofacial trunk.
2. The lingual artery is found in a position more inferior than the one classically described based on the anatomic structures: the digastric muscle, the hyoid bone and the hypoglossal nerve.
3. The hyoid bone can be used as a point of reference for the ligature of the lingual artery once this vaso is often above this bone.
4. There is a correlation among the distances of the origins of the lingual artery and the left and the right facial artery.
5. The negative correlation between the lingual artery and the bifurcation of the right common carotid can suggest a work with children to verify when the asymmetry occurs.

RESUMEN: La arteria lingual es un ramo de la arteria carótida externa, responsable de la vascularización de la lengua y regiones vecinas. La herniaria proveniente de una lesión de la arteria lingual puede ocurrir durante el procedimiento dental (accidentes operatorios por un instrumento quirúrgico o disco rotatorio), por trauma, biopsia y por colocación de implante dentario. Como en algunos casos, se vuelve difícil contener la herniaria donde el vaso fue lesionado, se hace necesario realizar la ligadura extra-oral de esta arteria. Por lo anterior, en este trabajo fueron estudiados los aspectos anatómicos de la arteria lingual, en 48 disecciones de cadáveres humanos fijados en formol 10%, con el objetivo de detallar el origen, trayecto y relaciones anatómicas de esta arteria en la región del trigono anterior del cuello, como también medir las distancias entre la arteria lingual y las arterias: facial, tireoidea superior y con la bifurcación de la arteria carótida común. Los resultados permitieron concluir que la arteria lingual se encuentra, generalmente, más inferior de lo clásicamente descrito, tomando como base el músculo digástrico y el nervio hipoglosso; y que el hueso hioíde puede ser usado como punto de referencia para el acceso quirúrgico a la arteria lingual, en la región del trigono anterior del cuello.

PALABRAS CLAVE: Arteria lingual; Tronco linguofacial; Lengua; Irrigación.

REFERENCES


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