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يحتوى هذا البحث على دراسة تفصيلية لمصدر ومسار وفروع الوريد الفكى العلوى للجمل وحيد السنم كما تمت مناقشة نتائج هذا البحث مع مثيلتها فى الحيوانات الأخرى .

ANATOMICAL STUDIES OF THE V. MAXILLARIS OF THE ONE HUMPED CAMEL
(CAMELUS DROMEDARIUS)
(With One figure)

By

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SUMMARY

The course and branches of the maxillary vein of the dromedary camel have been carefully dissected and described. The differences between the maxillary vein of camel and that of other domestic animals are completely discussed.

INTRODUCTION

The A. maxillaris of the camel was described by (AHMED 1973) and (BADAWI *et al.* 1977). However, a complete knowledge study on the maxillary vein in the same animal was carried out by (HASHIM 1980).

MATERIAL AND METHODS

Ten heads of adult camels of the species *Camelus dromedarius* were used for this work. The heads were injected with blue coloured gum milk latex through the right and left facial veins after ligation of both the external jugular veins. The specimens were preserved in 10% formalin.

RESULTS AND DISCUSSION

The maxillary vein (4) originates about 5 - 6 cm caudal to the angle of the mandible as one of the terminal branches of the V. jugularis externa. Similar result was also described in domestic animals by (TAYEB 1951), (HEESCHEN 1958), (SCHWARZ 1959), (LE ROUX 1959), (MILLER *et al.* 1964), (RAGHAVAN 1964), (FRENZEL 1967), (SISSON and GROSSMAN 1968), and (WILKENS and MUNSTER 1976).

The maxillary vein ascends subcutaneously for about 2 cm in a dorsolateral direction to pass through a notch situated at the proximal part of the caudal border of the ramus mandibules just distal to the condylar process. Between the mandible laterally and the M. pterygoideus medialis medially, the maxillary vein forms the plexus pterygoideus (26) either directly or after dividing into two branches. The maxillary vein detaches several parotidial branches in addition to the following vessels:

V. auricularis caudalis:

The caudal auricular vein (18) arises from the caudal aspect of the V. maxillaris at the caudoventral angle of the Gl. parotis. In two examined cases it originated from the dorsal aspect of the V. jugularis externa 3 cm caudal to the origin of the maxillary vein.

(TAYEB 1951) gave the origin of the V. auricularis caudalis in camel from the V. jugularis (externa) resembling only the 2 cases found in this work. The origin of this vessel from the maxillary vein in camel is similar to that of other domestic animals as stated by (WILKENS and MUNSTER 1976), However (SCHWARZ 1959) in goat, (RAGHAVAN 1964) in cattle as well as (SISSON and GROSSMAN 1968) in horse reported that the caudal auricular vein arises from the V. jugularis (externa).

The caudal auricular vein ascends toward the base of the ear insinuating between the lobules of the Gl. parotis, then continues caudal to the base of the ear undercover of the scutular muscles where it terminates.

The vein gives off 8 - 9 glandular branches to the parotid, one or two branches to the mandibular gland, and 2 muscular branches for the Mm. brachiocephalicus, splenius and obliquus capitis cranialis and the skin of the region. Moreover the caudal auricular vein gives the following:

1- V. stylomastoidea:

The stylomastoid vein arises from the caudal auricular vein at the level of the ventral end of the jugular

process. It passes in a rostradorsal direction undercover the Gl. parotis to enter the foramen stylomastoidea accompanied by its homonymous artery and in relation to the facial nerve.

The origin of stylomastoid vein in camel is similar to that stated by (HEESCHEN 1958) in sheep, (LE ROUX 1959) in cattle as well as (WILKENS and MUNSTER 1976) in dog and ruminants. However (RUMPLER 1967) mentioned that this vessel in horse and dog originates from the V. auricularis profunda. Moreover, (SCHWARZ 1958) stated that the stylomastoid vein in goat is detached either from the V. cerebri ventralis or the V. auricularis caudalis, while (BECKER 1960) described this vessel as a branch of the V. condylica in pig.

2- V. auricularis medialis:

The medial auricular vein originates by stem vessel with the lateral auricular vein. Only in few examined cases it was detached from the rostral auricular vein. It passes dorsomedially undercover the M. fronto-scutularis to reach the medial border of the conchal cartilage, and continues toward its apex, where it anastomoses with branches of the Vv. auriculares lateralis et intermedia.

The origin of the medial auricular vein in camel resembles only that of horse (BRADLEY, 1923), however in cat (FRENZEL, 1967) and dog (RUMPLER 1967) the vein arises from the rostral auricular vein while in sheep (HEESCHEN, 1958) and cattle (LE ROUX, 1959) the vein originates from the superficial temporal vein.

3- V. auricularis lateralis:

The lateral auricular vein originates by a stem vessel with the medial auricular vein, while in 4 cases it arose separately from the caudal auricular vein. It passes along the lateral border of the conchal cartilage toward the apex, where it divides into several branches.

The branches of the Vv. auriculares medialis et lateralis in addition to those of Vv. auriculares intermedia connect together forming a widely meshed network.

4- Vv. auriculares intermedia:

The intermediate auricular veins are represented by two vessels, which pass subcutaneously on the convex surface of the conchal cartilage toward its apex.

V. masseterica ventralis:

The ventral masseteric vein (19) originates in 70% of cases together with the transverse facial vein from the V. maxillaris about 3 cm ventral and slightly caudal to the temporomandibular joint. In the rest of specimens the vein arose separately from the parent vessel.

The vein passes ventrally for about 1 cm between the lateral aspect of the ramus of the mandible medially and the M. masseter laterally and divides into 2 - 3 branches which inturn gives several small twigs that share in the formation of the plexus massetericus.

The origin of the ventral masseteric vein in the camel resembles that (MILER *et al.* 1964) in dog and (LE ROUX 1959) in cattle as well as (SISSON and CORSSMAN 1968) in dog and horse. However (WILKENS and MUNSTER 1976) stated that the V. masseterica ventralis is only found in ruminants and horse.

According to (TAYEB 1951) in camel and (RAGHAVAN 1964) in cattle, the V. masseterica originates from the V. jugularis (externa).

Plexus massetericus:

The masseteric plexus lies between the fossa masseterica medially and the M. masseter laterally. It is formed by an anastomoses established between the branches of V. masseterica ventralis, R. massetericus of the V. facialis. V. transversa faciei and the V. zygomaticus. It vascularizes the M. masseter.

A similar masseteric plexus is described also in cattle, in which the V. buccinatoria shares in its formation (LE ROUX, 1959).

V. transversa faciei:

In most examined cases the transverse facial vein (21) originates from the V. maxillaris by a stem vessel with the V. masseterica ventralis, while in 25% of cases it arose separately. In one case it was detached together with the V. temporalis superficialis from the parent vessel.

The transverse facial vein passes in a rostral direction crossing the caudal border of the M. masseter to gain its lateral aspect parallel to the ventral border of the Arcus zygomaticus, then continues rostroventrally

undercover of the Mm. zygomaticus and malaris to gain the facial vein.

During its course, the transverse facial vein detaches 3 - 4 parotidial branches and 5 - 6 muscular branches for the Mm. masseter, zygomaticus, malaris and the skin of the area. In addition, it gives a considerable branch which passes to the fossa temporalis where it terminates near the root of the zygomatic process of the temporal bone by joining the caudal deep temporal vein forming the plexus temporalis. Moreover, the transverse facial vein gives off the superior and inferior lateral palpebral veins.

The origin of the transverse facial vein is not similar to that stated by (TAYEB 1951) in camel (MILLER *et al.* 1964) in dog, (McLEOD 1958) and (RAGHAVAN 1964) in cattle as well as (SISSON and GROSSMAN 1968) in horse. They recorded the origin from the superficial temporal vein. Moreover this result in camel is unlike that described by (LE ROUX 1959) in cattle and (BECKER 1960) in pig in which a common stem for the V. transversa faciei and V. temporalis superficialis is detached from the V. maxillaris.

V. palpebralis superior lateralis:

The lateral superior palpebral vein (22) is detached from the transverse facial vein just caudal to the zygomatic process of the frontal bone. It passes in a rostradorsal direction crossing the lateral aspect of the zygomatic arch, then continues subcutaneously to reach the lateral part of the palpebra superior where it distributed. It terminates by joining the V. palpebralis superior medialis. In addition it anastomoses with the V. lacrimialis through a twig which passes within the corpus adiposum extraperiorbitale.

V. palpebralis inferior lateralis:

The lateral inferior palpebral vein (23) arises from the transverse facial vein at a level 3 cm ventral to the lateral angle of the eye. In four examined cases the vein was seen to arise from the V. palpebralis superior lateralis.

It passes in a dorsorostral direction undercover the M. malaris, to the lateral part of the inferior palpebra where it ramifies supplying the lateral part of the inferior palpebra and the M. malaris. In addition it anastomoses with the V. palpebralis inferior medialis.

According to (WILKENS and MUNSTER 1976) the V. palpebralis inferior lateralis is detached in ruminants and pig from the V. transversa faciei as in camel.

V. temporalis superficialis:

The superficial temporal vein (24) originates from the dorsal aspect of the V. maxillaris about 5 - 6 cm ventral to the root of the zygomatic process of the temporal bone. In one examined case it arose with the V. transversa faciei by a stem vessel from the parent vessel.

It passes in a dorsal direction undercover the Gl. parotis and soon divides into branches which rejoin after a short course. The superficial temporal vein continues rostral to the base of the ear between the Mm. scutularis and M. temporalis and terminates about 2 cm rostral to the nuchal crest by dividing into several branches supplying the before mentioned muscles and the skin of the region. Just rostral to the retroarticular foramen the superficial temporal vein joins by a small anastomotic branch the V. emissaria foraminis retroarticularis. Another anastomotic branch passes medial to the base of the ear to connect the superficial temporal vein with the caudal auricular vein. In addition it anastomoses with the plexus temporalis within the texture of the M. temporalis.

The superficial temporal vein detaches 5-6 twigs to the Gl. parotis as well as the V. auricularis rostralis.

The origin of the superficial temporal vein in camel resembles that mentioned by (FRENZEL 1976) in cat, (RUMPLER 1967) and (MILLER *et al.* 1964) in dog, (HEESCHEN 1958) in sheep, (SCHWARZ 1959) in goat, (LE ROUX 1959) in cattle as well as (WILKENS and MUNSTER 1976) in most domestic animals. However (TAYEB 1951) in camel, (McLEOD 1958) and (RAGHAVAN 1964) in cattle as well as (SISSON and GROSSMAN 1968) in horse stated that the superficial temporal vein is one of the terminal branches of the V. jugularis (externa).

V. auricularis rostralis:

The rostral auricular vein is detached from the caudal aspect of the V. temporalis superficialis as the latter crosses the lateral aspect of the root of the zygomatic process of the temporal bone.

It passes in a rostral direction undercover the scutular cartilage then divides into several branches terminating in the M. scutularis. Along its course, the rostral auricular vein detaches the V. auricularis profunda and 3 - 4 parotidial branches. In four examined cases it detaches the V. auricularis medialis.

V. auricularis profunda:

The deep auricular vein is detached from the V. auricularis rostralis just dorsal to the external acoustic meatus undercover of the scatular cartilage. It pierces the rostromedial surface of the distal part of the conchal cartilage about 0.5 cm dorsal to the external acoustic meatus to terminate in the inner skin of the concha.

V. emissaria foraminis retroarticularis:

The emissary vein (25) of the retroarticular foramen originates from the dorsal aspect of the V. maxillaris at the ventral end of the jugular process.

It ascends undercover the Gl. parotis rostral to the jugular process to enter the cranial cavity through the retroarticular foramen.

The origin of the V. emissaria foraminis retroarticularis in camel is similar to that of dog (MILLER *et al.* 1964), sheep (HEESCHEN, 1958) and goat (SCHWARZ, 1959). But in pig (BECKER, 1960) it arises from the V. dorsalis linguae, while in cattle this vein originates from the superficial temporal vein (LE ROUX, 1959 as well as WILKENS and MUNSTER, 1976).

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