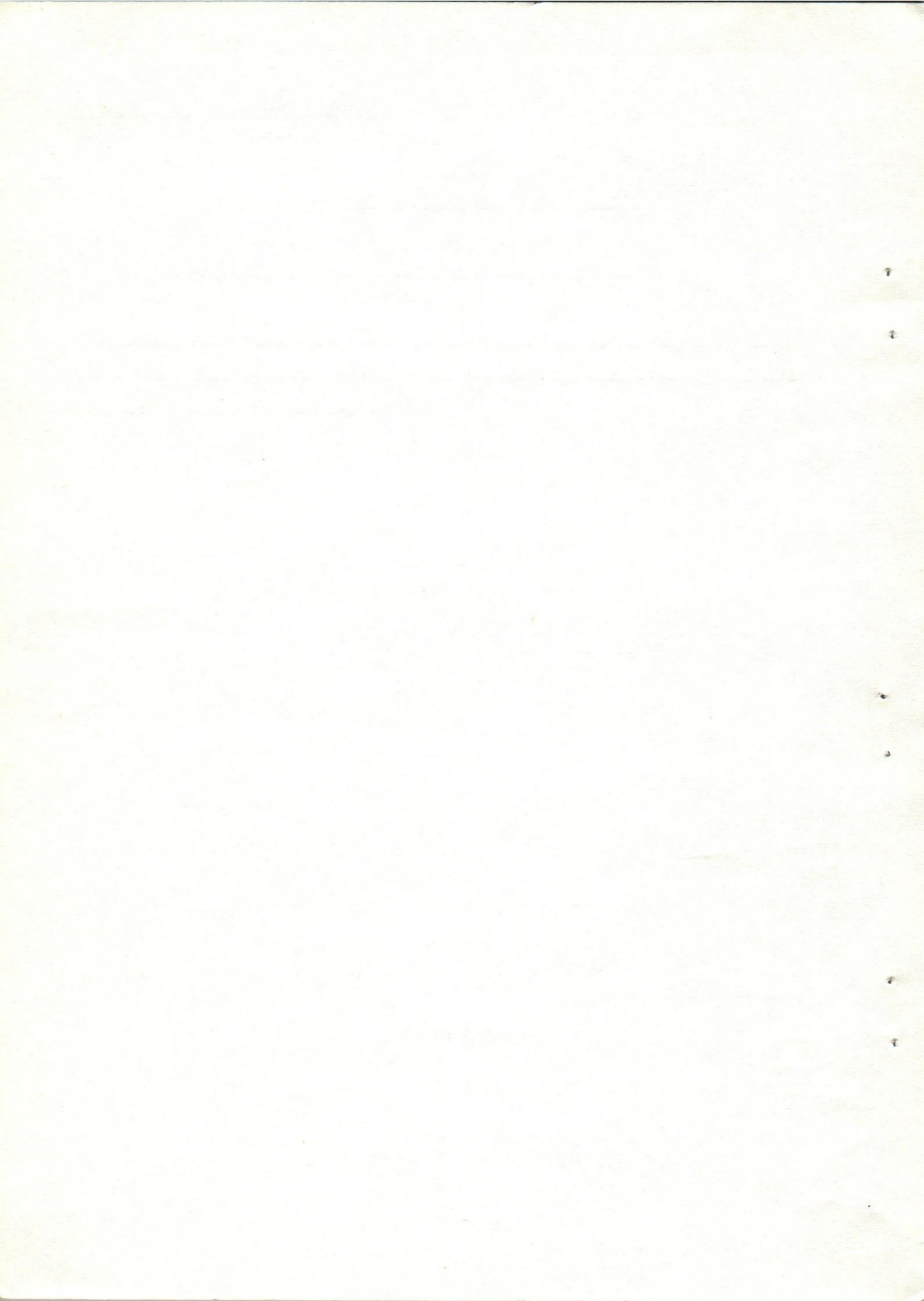


قسم التشريح - كلية الطب البيطري - جامعة أسيوط.
رئيس القسم : دكتور/ عبدالله حفى .

دراسات تشريحية للتوريد الوجهى للجمل وحيد السنام

عبدالله حفى ، أحمد قناوى ، كمال هاشم

تم فى هذا البحث وصف مصدر ومسار وفروع التوريد الوجهى فى الجمل
وحيد السنام ، كما تم مقارنة هذه النتائج بمثلتها فى الحيوانات
المستأنسة الأخرى .



ANATOMICAL STUDIES OF THE V. FACIALIS OF THE ONE HUMPED CAMEL (CAMELUS DROMEDARIUS)
(With One Figure)

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SUMMARY

The origin, course and branches of the facial vein of the one humped camel have been carefully dissected and described. Generally, a great similarity was found to occur between the facial vein of camel and that of ruminants. The differences between the facial vein in camel and other domestic animals are completely discussed.

INTRODUCTION

The venous drainage of the face of the one humped camel is not completely clear in comparison with that of other domestic animals. The arterial supply of the head in camel was previously described by AHMED (1973), while the venous drainage is recently examined by HASHIM (1980). The nomenclature used in this work was that adopted by the Nomina Anatomica Veterinaria (1973).

MATERIAL AND METHODS

Ten heads together with attached parts of the neck at the level of the third cervical vertebra of adult camels were injected with blue coloured gum milk (latex) through the facial veins after ligation of the external jugular veins. The vertebral canal was also occluded in addition to the transverse canals. The specimens were then preserved in 10% formalin.

RESULTS AND DISCUSSION

The facial vein (1/3) originates from the rostral aspect of the V. jugularis externa about 5-6 cm caudal to the angle of the mandible. In two examined cases it was observed that the facial vein arose together with the lingual vein by a common stem, V. linguofacialis, similar to that found in most animals as stated by WILKENS and MUNSTER (1976). TAYEB (1951) mentioned that the V. facialis of the camel arises from the V. jugularis (externa) similar to the present findings.

The facial vein descends in a rostral direction between the Gl. parotis dorsally and the lymphonodi mandibularis ventrally till the angle of the mandible. It continues in a rostradorsal direction between the M. masseter and the Pars buccalis of the M. buccinator medially and the Mm. cutaneous faciei, zygomaticus and malaris laterally where it is crossed by the dorsal buccal nerve. At a point 3-4 cm dorsal and 1-2cm rostral to the foramen infraorbitale, the V. facialis terminates by dividing into the V. dorsalis nasi and the V. angularis oculi. Similar findings are also reported by TAYEB (1951) in camel, MILLER *et al.* (1964) in dog, McLEOD (1958), SISSON and GROSSMAN (1968) in cattle as well as WILKENS and MUNSTER (1976) in all domestic animals. However, HEESCHEN (1958) and LE ROUX (1959) stated that the V. facialis vein continues its course as V. frontalis (S. supraorbitalis) after detaching the V. dorsalis nasi in sheep or the V. angularis oculi in cattle. According to BECKER (1961) the facial vein in pig joins the nasofrontal vein after detaching the Vv. angulares oculi, from this union originates the V. nasalis nasi.

The V. facialis gives off 3-4 parotidial branches and 2-3 twigs for the Ln. mandibularis as well as several muscular and cutaneous branches for the muscles and skin of the face. The following branches are also detached from the facial vein:

Ramus massetericus:

The massetric branch originates at the angle of the mandible, it ascends within the texture of the M. masseter to drain the Mm. masseter and pterygoideus medialis. Ascending twigs from the R. massetericus join descending branches from the V. transversa faciei and V. masseterica ventralis forming plexus massetericus. A similar massetric branch is also described by LE ROUX (1959) as a branch from the V. linguofacialis in cattle.

V. submentalis:

The submental vein (1/6) arises in 80% of examined cases from the facial vein while in the rest of cases it arose from the V. lingualis. The origin of the submental vein in the camel resembles that stated by SCHWARZ (1959) in goat and RUMPLER (1967) in dog as well as WILKENS and MUNSTER (1976) in dog and cattle. According to LE ROUX (1959) the submental vein in cattle arises from the V. lingualis as that described also in cat by WILKENS and MUNSTER (1976), the latter authors stated that the submental vein arises in pig, small ruminants and horse from the sublingual vein. However MILLER *et al.* (1964) mentioned that this vein in dog arises from the hyoid arch. RUMPLER (1967) described in addition to the V. submentalis in dog, a ramus submentalis that always arises as a single vessel from the hyoid arch.

V. labialis mandibularis superficialis:

The superficial mandibular labial vein (1/7) arises at the angle of the mandible. It passes rostrad along the ventral border of the Gl. buccalis ventralis in company with the ventral buccal nerve. At the level of the angle of the mouth it continues its course rostrally within the texture of the M. mentalis parallel to the free border of the labium mandibulae to join its fellow of the other side. Along its course, it detaches several muscular and cutaneous branches to the Mm. depressor labii mandibularis, mentalis and cutaneous facial as well as the skin of this area, in addition it gives off 3-4 branches to the Gl. buccalis ventralis. The vessel joins the Vv. mentales and the V. labialis mandibularis (profunda) through 2-3 anastomotic branches. Moreover it detaches a considerable anastomotic branch which joins the Sinus buccalis. The V. labialis mandibularis superficialis was also described in cattle by McLEOD (1958), LE ROUX (1959) as well as WILKENS and MUNSTER (1976).

V. labialis mandibularis profunda:

The deep mandibular labial vein (1/8) is detached from V. facialis vein close to the caudodorsal angle of the Gl. buccalis ventralis. In two examined cases it arose with the V. glandulae buccalis and the V. faciei profunda by a stem vessel. It passes rostralwards along the dorsal border of the Gl. buccalis ventralis then continues within the texture of the labium mandibulae where it terminates by joining the V. labialis mandibularis superficialis of the same side.

During its course, the V. labialis mandibularis profunda; detaches 8-9 twigs to the dorsal aspect of the Gl. buccalis ventralis and 2-5 twigs to the ventral part of the Gl. buccalis intermedia in addition to 4-5 branches for the M. buccinator and the labium mandibulae. A similar vein is also found in cattle as stated by LE ROUX (1969) as well as WILKENS and MUNSTER (1976). McLEOD (1958) described this vein under the name ventral labial vein. The V. labialis mandibularis was described by MILLER *et al.* (1964) in dog and BECKER (1960) in pig as well as SISSON and GROSSMAN (1968) in horse to have a similar origin and course to the V. labialis mandibularis profunda in camel.

V. glandulae buccalis:

The buccal glandular vein (1/9) originates either separately in 65% of cases or together with the V. faciei profunda in 25% of specimens, while in the rest of cases it arose by a stem vessel with the V. faciei profunda and the V. labialis mandibularis profunda. It passes rostralwards then divides into a dorsal and a ventral branch. The dorsal branch passes rostrally insinuating between the lobules of the Gl. buccalis intermedia to reach the labial commissure where it curves slightly dorsal to pass in the texture of the labium maxillare. It terminate by joining the V. angularis oris. The ventral branch terminates within the lobules of the Gl. buccalis ventralis. The V. glandulae buccalis of camel is similar to the described by BECKER (1960) in pig.

Plexus buccalis:

The buccal plexus is formed by branches from the Vv. glandulae buccalis, labialis maxillaris profunda, angularis oris and V. labialis mandibularis profunda. These branches anastomose with each other forming a wide meshed network between the lobules of the glandula buccalis intermedia and the buccal mucous membrane. It drains the Mm. buccinator, zygomaticus and the buccal mucous membrane. The buccal plexus of the camel is similar to that described by LE ROUX (1959) in cattle as well as SISSON and GROSSMAN (1968) in horse. However, the buccal plexus in the camel receives its main tributaries from the V. glandulae buccalis which is absent in both species.

V. faciei profunda:

A detailed study on the course, distribution and branches of the deep facial vein is in press.

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V. palpebralis inferior medialis:

The medial inferior palpebral vein (1/10) is detached from the caudal aspect of the V. facialis about 3 cm. caudoventral to the foramen infraorbitale. It passes caudodorsal to reach the medial angle of the eye where it continues within the palpebra inferior and anastomoses with the V. palpebralis inferior lateralis of the V. transversa faciei. In addition, it joins the V. malaris and anastomose with the V. palpebralis superior medialis. The origin of this vessel in camel is similar to that of pig and the V. palpebralis inferior of dog as stated by WILKENS and MUNSTER (1976).

V. palpebralis superior medialis:

The medial superior palpebral vein (1/11) arises in 75% of examined cases from the rostral aspect of the V. facialis 1 cm dorsal to the origin of the medial inferior palpebral vein. In the rest of cases it was detached from the before mentioned vessel. It passes in a caudodorsal direction to reach the medial part of the palpebra superior in which it ramifies. According to HEESCHEN (1958) the superior palpebral vein in sheep has the same origin as in camel while in cattle it originates from the V. temporalis superficialis as stated by LE ROUX (1959). WILKENS and MUNSTER (1976) reported that the V. palpebralis superior medialis originates in all domestic animals from the V. angularis oculi.

V. labialis maxillaris profunda:

The deep maxillary labial vein (1/12) originates just dorsal and rostral to the infraorbital foramen. In one examined case it arose by two roots and in another by three. It passes in a rostral direction to reach the texture of the labium maxillare where it terminates by dividing into a smaller dorsal and a larger ventral branch. The dorsal branch passes in a rostradorsal direction to reach the ventral angle of the nostril where it terminates by joining its fellow of the other side. Along its course, it detaches several twigs to the Labium maxillare and the ventral angle of the nostril. The ventral branch passes rostroventrad till it reaches the level of the labial commissure where it continues within the texture of the Labium maxillare 1 cm. dorsal and parallel to its free border and terminates near the philtrum.

The ventral branch detaches the V. angularis oris about 2 cm rostral to the labial commissure. It descends in a caudal direction within the texture of the labium maxillare to terminate in the angle of the mouth by dividing into several branches. It joins the dorsal branch of the V. glandulae buccalis and shares in the formation of the buccal plexus. The deep maxillary labial vein in camel resembles in origin and course that described by LE ROUX (1959) in cattle and by WILKENS and MUNSTER (1976) in ruminants.

V. labialis maxillaris superficialis:

The superficial maxillary labial vein (1/13) originates about 1 cm dorsal to the Foramen infraorbitale. In a specimens it arose by two roots from the parent vessel, while in one case it was detached by a stem vessel together with the deep maxillary labial vein. It passes rostrally detaching several branches to the Mm. levator nasolabialis et caninus as well as the Labium maxillare. The superficial maxillary labial vein is also described in cattle by LE ROUX (1959) as well as WILKENS and MUNSTER (1976). A similar vessel is found also in goat and named by SCHWARZ (1959) V. labialis maxillaris dorsalis.

V. dorsalis nasi:

The dorsal nasal vein (1/14) is one of the terminal branches of the V. facialis. It originates 1 cm rostral and 3 cm dorsal to the foramen infraorbitale. It passes in a rostral direction to reach the dorsal border of the nasal process of the premaxilla where it terminates by dividing into 4-5 small branches sharing in the formation of the nasal venous plexus. Moreover, it detaches an anastomotic branch which joins the veins of the other side and the V. nasalis impar. TAYEB (1951) in camel, McLEOD (1958). in cattle MILLER *et al.* (1964) in dog, SISSON and GROSSMAN (1968) in horse, as well as WILKENS and MUNSTER (1976) in most domestic animals stated that the V. dorsalis nasi forms one of the terminal branches of the V. facialis as the case found in camel.

The dorsal nasal vein in camel detaches the V. lateralis nasi (1/15) which was detaches from the facial vein in 8 dissected cases. The lateral nasal vein passes rostral undercover the M. levator nasolabialis to reach the dorsal angle of the nostrile where it divides into 4-5 twigs which share in the formation of the nasal venous plexus. SCHWARZ (1959) in goat and BECKER (1960) in pig found that the dorsal and lateral nasal veins arise together from a single V. nasalis. The nasal venous plexus in sheep is formed according to HEESCHEN (1958) by branches

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of the V. lateralis nasi, while in goat and pig the plexus is formed by branches of the dorsal nasal vein as stated by SCHWARZ (1959) and BECKER (1960). In cattle similar to that found in camel, LE ROUX (1959) reported that the plexus is formed by branches from both Vv. lateralis and dorsalis nasi together with other nasal veins.

V. angularis oculi:

The angular vein of the eye (1/17) is the second terminal branch of the V. facialis and appears as its direct continuation. It curves in a caudodorsal direction subcutaneously along the caudodorsal border of the orbit to continue its course within the supraorbital canal as V. frontalis. The angular vein detaches 3-4 Vv. diplocae frontalis. It joins its fellow of the other side through 2-3 connecting branches, and from the rostral connection the V. nasalis impar is detached. In agreement with TAYEB (1951) the V. angularis oculi of camel forms one of the terminal branches of the V. facialis as stated also by MILLER *et al.* (1964) in dog, RAGHAVAN (1964) in cattle as well as SISSON and GROSSMAN (1968) in horse. Moreover WILKENS and MONSTER (1976) mentioned that this case is found in all domestic animals. FRENZEL (1967) and RUMPLER (1967) described the V. angularis oculi in cat and dog as the facial vein, while BECKER (1960) reported that the V. angularis oculi in pig is a side branch from the V. facialis similar to that described in cattle by LE ROUX (1959). SCHWARZ (1959) stated that in goat the V. nasofrontalis is the most suitable name for the V. angularis oculi.

The before mentioned V. nasalis impar passes subcutaneously in a rostral direction along the Surtura internasalis till it reaches a level caudal to the rostral extremity of the Septum nasi, where it anastomoses with the Vv. dorsales nasi. It descends along the rostral extremity of the nasal septum where it terminates. A similar nasal vein is not reported by WILKENS and MUNSTER (1976) in the other domestic animals.

V. frontalis:

The frontal vein forms the direct continuation of the V. angularis oculi. It passes within the supraorbital canal and detaches 2-3 fine twigs to the mucous membrane of the frontal sinus. The frontal vein terminates within the orbit by joining the V. ophthalmica externa dorsalis. TAYEB (1951) gave no clear description for the origin of the frontal vein in the camel. He described the V. angularis oculi as one of the roots of the facial vein and communicates directly with the frontal vein which joins the ophthalmic vein by passing through an osseous canal. He added that the frontal vein can be considered as the direct continuation of the V. angularis oculi and passes through the osseous canal to join the ophthalmic vein which agrees with the present results. HEESCHEN (1958) and LE ROUX (1959) stated that the frontal vein forms the direct continuation of the facial vein in sheep and cattle. SCHWARZ (1959) and BECKER (1960) mentioned that the frontal vein in goat and pig arises from the orbital venous plexus or the lacrimal vein in pig and passes through the supraorbital canal. It either joins the nasofrontal vein in goat or continues as V. nasofrontalis in pig. MILLER *et al.* (1964) in the dog described the origin of the frontal vein from the V. angularis oculi, but RUMPLER (1967) stated that this vein is absent in dogs. According to WILKENS and MUNSTER (1976) the frontal vein forms a side branch from the angular vein of the eye.

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FIGURE (1)

Superficial Dissection Of The Veins Of The Head Of The Camel, Left Side.

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|--|---|
| A- Gl. Parotis. | D- Ln. mandibularis. |
| B- Gl. buccalis ventralis. | E- For. infraorbitale. |
| C- Gl. buccalis intermedia. | |
| a- M. semispinalis capitis. | g- M. temporalis. |
| b- M. longissimus capitis. | h- M. buccinator. |
| c- M. obliquus capitis caudalis. | i- M. cutaneous faciei. |
| d- M. longissimus atlantis. | j- M. zygomaticus. |
| e- M. sternothyrohyoideus. | k- M. levator nasolabialis. |
| f- M. masseter. | l- M. caninus. |
| 1- V. jugularis externa. | 12- V. labialis maxillaris profunda. |
| 2- V. lingualis. | 13- V. labialis maxillaris superficialis. |
| 3- V. facialis. | 14- V. dorsalis nasi. |
| 4- V. maxillaris. | 15- V. lateralis nasi. |
| 5- V. submentalís. | 16- V. angularis oculi. |
| 6- V. labialis mandibularis superficialis. | 17- V. transversa faciei. |
| 7- V. labialis mandibularis profunda. | 18- V. palpebralis superior lateralis. |
| 8- V. glandulae buccalis. | 19- V. palpebralis inferior lateralis. |
| 9- V. faciei profunda. | 20- V. mentalis caudalis. |
| 10- V. palpebralis inferior medialis. | 21- V. mentalis rostralis. |
| 11- V. palpebralis superior medialis. | 22- Anastomotic branch of the V. labialis mandibularis superficialis with the Sinus buccalis. |

