دراسة تشريحية على العصب الوجهى للجمل ذو السنام الواحد

م . الشـــــايب

لقد تـم فى هذا البحث شرح تفصيلى لمسار وعلاقات واتحادات وتوزيع العصب الوجهى للجمل ذو السنام الواحـد ـ كما ذكر أيضا فى هذا البحث الخصائص التشريحيـــــه للعصب الوجهى الخاصة بهذا النوع من الحيوانات .

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ANATOMICAL STUDIES ON THE N. FACIALIS OF CAMELUS DROMEDARIUS

(With Two Figures)

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SUMMARY

The course, relations, communications and distribution of the facial nerve of the camel (Camelus dromedarius) were described in details. The anatomical peculiarities of the facial nerve of this species of animals were given in this investigation.

INTRODUCTION

Many surgical operations in the region of the face necessitate the injections of local anaesthesia, to block the facial nerve and its branches. In this respect it is important to know the detailed anatomical feature of the facial nerve, which in most domesticated animals were fully described by many authors. But in the camel only a brief general description was given by LESBRE (1903), LEESE (1927), DROANDI (1936), TAYEB, (1957) and ARNAUTOVIC et al. (1970) are available in the literature.

Thus the present investigation is carried out with the object to get more and sufficient description of the N. facialis of the camel after its emergence through the stylomastoid foramen, the result which will be a guide to those working in the field of surgery.

MATERIAL AND METHODS

The course, relations and distributions of the facial nerve and its branches, after its emergence through the stylomastoid foramen, were studied by carefull dissection on ten heads of Camelus dromedarius of different sex and age. The heads were preserved in 10% formalin solution. The nomenclature used was adopted by N.A.N. (1973).

The facial nerve (2/1) arises from the lateral aspect of the corpus trapezoideum of the medulla oblongata reaches the facial canal after passing through the internal acoustic meatus. It emerges through the stylomastoid foramen where it courses ventral with a rostral direction at first under then in the texture of the parotid salivary gland. After 2-2.5 cm from the stylomastoid foramen the facial nerve terminates by dividing into two unequal branches, the larger is the dorsal buccal branch (ramus buccalis dorsalis) (1/1, 2/6) and the smaller is the ventral buccal branch (ramus buccalis ventralis) (1/2,2/7).

After its exit from the stylomastoid foramen to its division the facial nerve detaches the following branches.
N. auricularis caudalis:

The caudal auricular nerve (2/2) is always separated from the facial nerve just before the emergence of the latter through the stylomastoid foramen. It courses caudel and dorsal parallel to the caudal aspect of the auricle covered by the parotid gland. It ramifies in the caudal and dorsal auricular muscles and the skin on the convex aspect of the external ear.

Ramus auricularis internus:

The internal auricular branch (2/3), similar to the preceeding nerve, it is also detached from the facial nerve just before the stylomastoid foramen is reached. In few cases however both the caudal auricular nerve and the internal auricular branch are given off by a common trunk. The internal auricular branch courses dorsal in the parotid gland 2.3-3.5 cm after which it pentrates the base of the auricle to ramify in the skin covering its concave aspect.

Ramus digastricus:

The digastric branch (2/4) emerges at the stylomastoid foramen or at a distance of 0.3-0.5 cm. rostral to the foramen. It then descends ventral under the parotid salivary gland giving twigs to the occipito-hyoideus and caudal belly of the digastric muscles and ends in the styohyoid muscle as ramus stylohyoideus.

Ramus colli:

The cervical branch (1/19, 2/5) is given off under the parotid salivary gland from the ventral border and just before the division of the facial nerve, however in few cases it detaches from its ventral buccal branch at the origin of the latter. It then courses ventral and slightly rostral in the parotid salivary gland to appear superficially at its middle portion terminating in the cutaneus faciei muscle and the skin at the angle of the mandible.

Plexus parotideus:

Very small twigs are given from the facial nerve and also from its dorsal and ventral buccal branches as well as from

the beginning of the auriculopalebral nerve, these twigs share in the formation of the parotid plexus.

Ramus buccalis dorsalis:

The dorsal buccal branch (1/1, 2/6) is the largest terminal branch courses rostral in the parotid salivary gland crossing the lateral aspect of the superficial temporal artery and the maxillary vein. Then it continues rostral along the lateral aspect of the masseter muscle. At the rostral border of the parotid salivary gland the dorsal buccal branch is related to the parotid lymph node. Along the masseter muscle it is covered by the fascia and skin only, it lies below the zygomatic arch at a distance of 5-6 cm and lies at a distance of 4 cm dorsal to the parotid duct. After 8-10cm of its course it lies under the zygomatic muscle and the M. depressor palpebralis inferioris. The dorsal buccal branch then continues rostral and slightly dorsal for about 3 cm where it is covered only by fascia and skin after which it courses under the M. molaris and M. levator nasolabialis it divides under the M. caninus into large branch and several small ones. The former branch joins the branches of the infraorbital nerve, while the small ones ramify in the muscles of the nostril and upper lip.

At a distance of 0.5-1 cm rostral to the rostral border of the parotid salivary gland or sometimes under the gland, the ventral branch of the auriculotemporal nerve crosses the dorsal buccal branch of the facial nerve obliquely and connecting with it.

Another connection is observed between the dorsal buccal branch of the facial nerve and the buccal nerve of the mandibular nerve by a strong branch which is given under the zygomatic muscle and just rostral to the rostral border of the masseter muscle.

Along its course the dorsal buccal branch detaches the following branches:

1. Small twigs are given to the parotid salivary gland.
2. N. auriculopalpebralis: The auriculopalpebral nerve (1/1, 2/8) is given off at a distance of 0.5-1 cm from the origin of the dorsal border of the dorsal buccal branch. It courses dorsal and slightly rostral through the parenchyma of the parotid gland accompanied by the rostral auricular artery. The nerve and the artery then cross the zygomatic arch, after which the nerve detaches the rostral auricular branch and continues rostral under the rostral auricular muscles as the ramus zygomaticus. The latter branch soon divides into medial and lateral branches.

The branches of the auriculo-palpebral nerve are:

A. Ramus auricularis rostralis:

The rostral auricular branch (1/6', 2/8') courses 1-2 cm dorsally infront of the base of the external ear, then divides into several twigs (rami auriculares rostrales)which innervate the rostral auricular group of muscles and the skin over the rostrodorsal aspect of the external ear. These branches are connected with branches from the auriculo-temporal nerve.

B. The lateral branch of the ramus zygomaticus (1/6''',2.8''') courses rostrally parallel to the zygomatic arch below the frontoscutular muscles. It anastomoses with the branches of the zygomaticotemporal branch of the lacrimal nerve forming plexus.

C. The medial branch of the ramus zygomaticus (1/6''',2/8'') has a curved course towards the medial angle of the eye where it anastomoses with the frontal nerve forming plexus. It also gives twigs, rami palpebralis, to the scular, orbicularis oculi and corregator supercilli muscles.

3. At the rostral border of the parotid salivary gland and at the union of the ventral branch of the auriculo-temporal nerve with the dorsal buccal of the facial nerve a considerable branch (1/5,2/9) is given off from the dorsal buccal, containing large amount of its fibers from the ventral branch of the auriculo-temporal nerve. This considerable branch soon divides into three twigs(rostral,middle and caudal) on the masseter muscle.

A. The rostral twig courses rostral and unites with the buccal nerve of the mandibular nerve under the M. zygomaticus.

B. The middle twig runs ventral and crosses the parotid duct and facial vessels to end in the cutaneus facei muscle.

C. The caudal twig passes ventrally and rostrally along the masseter muscle crossing the parotid duct, facial vessels and ventral buccal glands to unite with the ventral buccal branch of the facial nerve. A small twig is given off from this caudal twig to the ventral buccal gland.

4. Another branch (1/11, 2/16) is given off rostral to the preceeding one from the dorsal buccal branch which ends in the M. cutaneus facei.

5. 2-3 cm rostral to the anastomoses of the dorsal buccal branch with the buccal nerve of the mandibular nerve, a branch is given from the dorsal buccal branch containing fibers derived from the buccal nerve of the mandibular nerve. This branch courses rostrally towards the angle of the mouth to ramify by several small twigs in the buccal and labial glands -(rami buccolabialis).

6. A large communicating branch is given to anastomose with the branches of the infraorbital nerve of the maxillary nerve.

7. Several muscular branches are given off from the dorsal bucøal branch to the muscles zygomaticus, nasolabialis. malaris, depressor palpebrae inferioris, caninus, levator and depressor labii maxillaris.

Ramus buccalis ventralis:

The ventral buccal branch (1/2, 2/7) is the smaller of the two terminal branches of the facial nerve, courses ventral and rostral under the parotid salivary gland crossing the lateral aspect of the maxiallry vein and form a sharp curve at angle of the mandible along the masseter muscle below the parotid salivary gland. At the rostral border of the latter the buccal branch appears and continues rostrally covered with the M. cutaneus facei then courses with the mandibular labial vessels along the lower border of the ventral buccal gland.

At a distance of 5-6 cm caudal to the angle of the mouth, it is connected by a large branch (1/3, 2/14) derived from the mandibular alveolar branch of the mandibular nerve. This large branch emerges from the mandibular canal through a caudal mental foramen. The combined nerve of the ventral buccal branch and of the mandibular alveolar nerve continues rostrally along with the mandibular labial artery to ramify together with the mental nerve in the lower lip and mentum.

Along its course the ventral buccal branch gives off the following branches:

1. 1-2 twigs are given to the parotid salivary gland.
2. Several muscular branches are given to the Mm. depressor labii mandibularis, buccinator and orbicularis oris.
3. Other twigs are given to the ventral buccal gland.

As mentioned before the ventral buccal branch is connected with the dorsal buccal branch.

N. chorda tympani:

The chorda tympani nerve of the camel emerges through the petrotympanic fissure and courses ventral and slightly rostral crossing the lateral or medial aspect of the maxillary artery. After a course of 7-8 cm from the fissure it joins the lingual nerve to be distributed with it in the mucous membrane of the rostral two thirds of the tongue and through the mandibular ganglion to the mandibular and sublingual salivary glands.

DISCUSSION

The present investigation shows that the digastric branch of the facial nerve of the camel is present, it supplies the

caudal belly of the digastric and occipitohyoid muscles and ends in M.stylohyoideus as ramus stylohyoideus.In this respect ARNAUTOVIC et al. (1970) reported that from its ventral margin the facial nerve of the camel gives off a small branch which more or less corresponds to the digastric branch in the horse, about 1.7 cm after emerging through the stylomastoid foramen and after a course under the parotid salivary gland it pierces the gland and lies on its surface then ramifies in the triosrius muscle.However this branch mentioned by ARNAUTOVIC et al. (1970) is found is this investigation to be similar to the ramus colli of the horse but it ends in the M. cutaneus facei instead of the M. colli a case which is similar to that of the pig GETTY (1975).

The ramus colli of the camel is found in the present work to arise from the main trunk of the facial nerve near the origin of the ventral buccal branch or from the beginning of the latter branch. While TAYEB (1957) mentioned that the ramus colli of the camel arises from the dorsal buccal branch a case which could not be observed. Nothing was given by GETTY (1975) on the ramus colli of the ox and goat but in the sheep he reported that twigs are sent from the ventral buccal branch to the cutaneus facei muscle.

The innervation of the masseter muscle by twigs from the dorsal buccal branch of the facial nerve as mentioned by ARNAUTOVIC et al. (1970) is not observed in this investigation and it is known that the masseter muscle is innervated by the masseteric branch of the mandibular nerve BRADKET (1947), AKAEVSKI (1968), GETTY (1975) and BADAWI and EL-SHAIEB (1975).

Special character to the ventral buccal branch of the facial nerve of the camel is it connects with a large branch from the mandibular alveolar nerve which emerges through the caudal mental foramen. This is also mentioned by ARNAUTOVIC et al. (1970) and BADAWI and EL-SHAIEB (1975).

The distribution of the chorda tympani nerve with the lingual nerve has been also described by BADAWI and EL-SHAIEB (1975).

The description of the facial nerve and its communications with other nerves should be of great benifit for the injection of local anaesthetics for veterinary surgery.

REFERENCES

Akaevski, A. E. (1968): Anatomiya domashnikh zhivotnyckn 2nd. Ed. Moskva.

Arnautovic, IK, Abu Sineina, M.E. and Stanic, M. (1970): The course and branches of the facial nerve of the one-humped camel. J. Anat., 106, 2 pp. 341 - 348.

Badawi, H. and El-Shaieb, M. (1975): Comparative anatomical studies on the N.mandibularis of caprine and camelus dromedarius in Egypt. Assiut Vet. Med. J. Vol. II, No. 3&4 pp. 3 - 17.

Bradley, O.C. (1947): Topographical anatomy of the horse (The head and neck). London.

Droandi, I. (1936): It camello. Instituto Agricole Colonicale lataliano, IV, p. 856 Firenze.

Getty, R. Sisson and Grossmans (1975): The Anatomy of the domestic animals. Saunders comp. Philadelphia London. Toronto.

Leese, A. S. (1927): A treatise on the one - humped camels, P. 282. Stamford : Haynes and Son.

LesbrenM.F.X.(1903): Recherches anatomiques sur les camelidés. Arch. Mus. d'Hist. Nat., Lyon. Henri George, Editeur lyon.

Nomina Anatomic Veterinari (1973): International Committe on Veterinary Anatomical Nomenclature. 2nd. Ed. World Association of Vet. Anatomists, Vienna.

Tayeb, M. A. F. (1957): The cranial nerves of the camel. Vet. Med. J., Giza No. 4, 171 - 182.

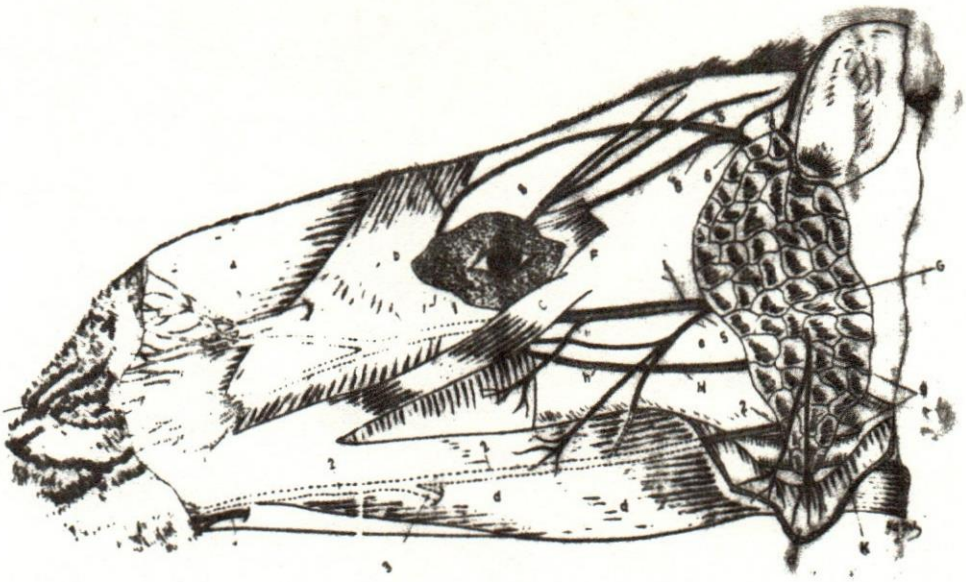

Fig. (1)

left surface of the head of the camel.

a. M.levator nasolabialis.
b. M.malaris.
c. M.zygomaticus.
d. M.cutaneus facei.
e. M.masseter.
g. Parotid salivary gland.
h. Parotid duct.
k. V.linguofacialis.

1- Ramus buccalis dorsalis.

2- Ramus buccalis ventralis.

3- Branch from mandibular alveolar n.

4- N. mentalis.

5- Considrable branch.

6- N. auriculopulpebralis.

6'- Ramus auricularis rostralis.

6''- Medial branch of 6.

6'''- Lateral branch of 6.

7- N.frontalis.

8-

9- Ramus

10- N.infraorbitalis.

11- Branch to M. cutaneus facei.

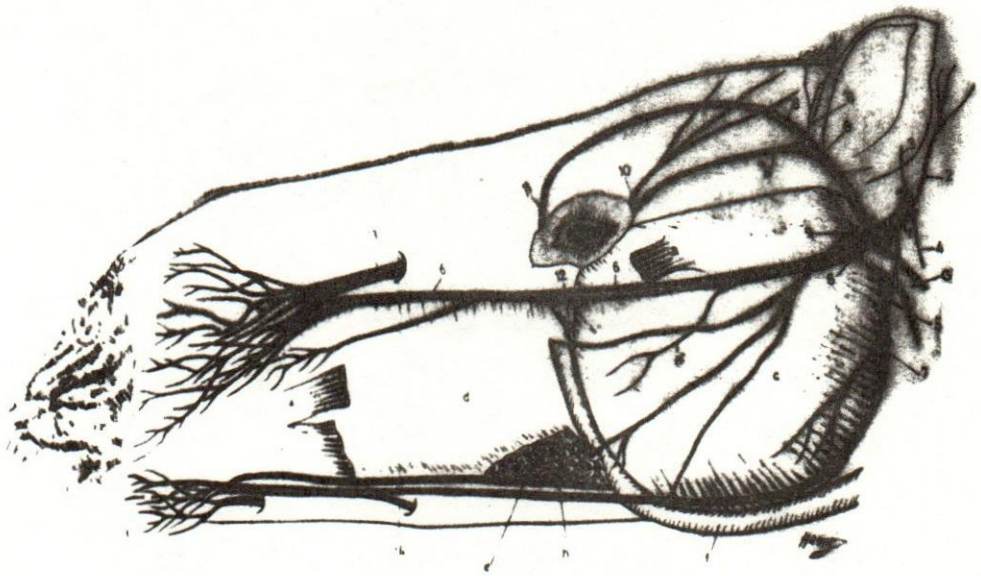

Fig. (2)

Left surface of the head of the camel, the parotid salivary gland is removed.

a. M.zygomaticus. B. M.cutaneus facei c.Masseter.
d. M.buccinatorius. e. Glandulae buccales ventrales.
f. V. linguofacialis. g. V.maxillaris.
h. A.labialis mendibularis.

1---N. facialis. 2- N. auricularis caudalis.
3 - Ramus auricularis internus.
4-- Ramus digastricus. 5- Ramus coll.
6 - Ramus buccalis dorsalis.
7 - Ramus buccalis ventralis.
8 - N.auriculopulpebralis.
8'- Lateral branch of 8. 9- Ventral branch of N.auriculotemporalis.
10- N. lacrimalis.
11- N.frontalis. 12- Branch of buccal n. of the mandibular n.
13- N.infraorbitalis. 14- Branch from mandibular alveolar n.
15- N.mentalis.
16- Branch to m. cutaneus facei.