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بعض الصفات التشريحية للعصب العيىنى  
فى الجملى وحيد السنام

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- تم فى هذا البحث دراسة العصب العيىنى وهو عصب حسى وأصغر الفروع الثلاثة للعصب الثالثوى . يسير هذا العصب على طول الجانب الوحشى للسبالة المتكهفة مع العصب الفكى العلوى ويخرج من التجويف القحافى خلال الثقب الحجابى حيث ينقسم الى الفروع الصدغى الوجنى والانفى الهدبى
- ١ - الفرع الصدغى الوجنى : وهو الفرع الاصغر للعصب العيىنى ويعطى العصب الدمسى .
  - ٢ - العصب الانفى الهدبى وهو يسير تحت العضلة المستقيمة الظهرية وينقسم الى :
    - أ - العصب المصفاوى الذى يترك الحجاج عن طريق الثقب المصفاوى .
    - ب - العصب الجبى الذى يمتد موازيا للعضلة المنحرفة الظهرية ثم يخترق الحول حجاج ويمر خلال الثقب فوق الحجابى . كما أن العصب تحت البكرى الذى يتجه الى المقاق الانسى للعين .



SOME ANATOMICAL FEATURES OF THE OPHTHALMIC NERVE IN THE ONE HUMPED CAMEL  
(CAMELUS DROMEDARIUS)  
(With One Figure)

By  
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SUMMARY

The ophthalmic nerve was examined in 10 heads of one-humped camel of both sexes and different ages.

The origin and branches of the ophthalmic nerve were completely examined and discussed with the available literatures of other domestic animals.

INTRODUCTION

The anatomical features of the cerebral nerves supplying the ocular muscles are completely described in most domestic animals other than camel. PRINCE, DIESEM, EGLITIS and RUSKELL (1960), GODINHO and GETTY (1971, 1975) and SEIFERLE (1975) gave a detailed description of the ophthalmic nerve, however, the lack of such knowledge in the one humped camel necessitates carrying out of this investigation.

MATERIAL and METHODS

The present study was carried out on 10 heads of adult camels (*Camelus dromedarius*) of both sexes and different ages. The specimens were collected from Cairo slaughter house. The heads were injected by 10% formalin solution and preserved for 24 hours before dissection was carried. The nomenclature used is that adopted by NOMINA ANATOMICA VETERINARIA (1973).

RESULTS

*N.ophthalmicus*:

The ophthalmic nerve (1/7), the smallest branch of the trigeminal nerve, originates from the convex border of the trigeminal ganglion (1/4'). It terminates after about 0.5 cm from its origin within the cranial cavity by dividing into a medial larger nasociliary nerve and a smaller lateral zygomaticotemporal branch.

*N.nasociliaris*:

The nasociliary nerve (1/10) is the larger medial branch of the ophthalmic nerve. It passes in a rostral direction to emerge from Foramen orbito-rotundum to lie between obliquus dorsalis and rectus medialis. It terminates between the latter muscle and periorbita by dividing into *N.ethmoidalis* and *N.frontalis*.

The nasociliary nerve detaches *N.ciliaris longus* and *R.communicans cum ganglio ciliaris*, in addition to two muscular branches. The first muscular branch arises at the Foramen orbito-rotundum and soon divides into two twigs, one for obliquus dorsalis and the other for rectus dorsalis, obliquus dorsalis and levator palpebrae superioris. The second muscular branch is given off the nasociliary nerve after the latter detaches the long ciliary nerve. It distributes in retractor bulbi and rectus medialis.

*N.ciliaris longus*:

The long ciliary nerve (1/12) is detached from the nasociliary nerve just before the latter passes between rectus dorsalis and retractor bulbi. It courses dorsal to the ventral branch of the oculomotor nerve, passes through the retractor muscle to gain the dorsomedial aspect of the optic nerve and pierces the sclera.

*R.communicans cum ganglio ciliaris*:

The communicating branch of the ciliary ganglion (1/13) is detached from the ventromedial aspect of the

nasociliary nerve at the same level of origin of the long ciliary nerve. It passes along the dorsal aspect of the ventral branch of the oculomotor nerve to join the caudodorsal angle of the ciliary ganglion.

#### N.ethmoidalis:

The ethmoidal nerve (1/14) is one of the terminal branches of the nasociliary nerve. It passes rostrally between rectus medialis and obliquus dorsalis where it curves in a caudomedial direction to gain the ethmoidal foramen.

#### N.frontalis:

The frontal nerve (1/15), the second terminal branch of the nasociliary nerve, passes in a rostradorsal direction along the external surface of rectus medialis and detaches N.infratrochlearis. At the dorsal border of the orbital rim it pierces the periorbita to gain the supraorbital foramen. After its emergence from the Foramen, the frontal nerve terminates by dividing into 3-4 twigs which distribute in the skin of the forehead.

#### N.infratrochlearis:

The infratrochlear nerve (1/16) originates from the frontal nerve at the external surface of M. rectus medialis. It passes in a rostral direction between the before mentioned muscle and periorbita then between the latter and Corpus adiposum intraperiorbitale to distribute in the medial canthus of the eye.

#### R.zygomaticotemporalis:

The zygomaticotemporal branch (1/11) is the smaller lateral branch of the ophthalmic nerve. It passes in a rostral direction between the maxillary nerve laterally and the nasociliary nerve medially to gain foramen orbitotundum. As it emerges from the foramen, it detaches the lacrimal nerve and joins the zygomaticofacial branch of the zygomatic nerve. In 5 dissected cases, the zygomatictemporal branch continues without joining the zygomaticofacial branch.

#### N.lacrimalis:

The lacrimal nerve (1/17) originates in 18 specimens in the camel from the zygomaticotemporal branch about 1 cm after its emergence from the Foramen orbitotundum, with two exceptional cases in which the lacrimal nerve arose from zygomaticotemporal branch just at its origin.

The lacrimal nerve passes rostrolaterally on the external surface of the M. rectus dorsalis covered by the periorbita to gain the deep surface of the lacrimal gland in which it terminates by dividing into two branches. Each of these branches is distributed in the gland and the adjacent part of the palpebral conjunctiva of the superior eyelid. About 1 cm. from its origin the lacrimal nerve, in 17 examined cases, gives a strong connecting branch which passes rostrolaterally to join the zygomatic nerve. Another communicating branch to the zygomaticotemporal branch was detected in 6 cases about 1 cm rostral to the first one and third one to the nasociliary nerve in 3 examined cases. The lacrimal nerve detaches muscular branches to Mm. rectus dorsalis, obliquus dorsalis and levator palpebrae superioris in addition to a relatively strong branch to the M. rectus lateralis. The last muscular branch is directed rostroventrally to terminate in the distal third of the external surface of the last mentioned muscle.

## DISCUSSION

The origin of the ophthalmic nerve in camel is similar to that reported by PRINCE *et al.*, (1960); GODINHO and GETTY (1975) and SIEFERIE (1975) in other domestic animals. Its two terminal branches are similar to those of pig, ruminants and horse observed by GODINHO and GETTY (1971, 1975). However, the same authors added that the ophthalmic nerve detaches N.lacimalis and N.frentalis in pig and horse in addition to N.sinum frontium in ruminants.

The division of the ophthalmic nerve into its primary branches within the cranial cavity in camel is not similar to that found in domestic animals. The division occurs just at the exit of the ophthalmic nerve from the orbital fissure in horse (BRADLEY, 1923) and dog (MILLER *et al.*, 1964) or from foramen orbitotundum as in pig and ruminants (GODINHO and GETTY, 1975).

## OPHTHALMIC NERVE IN CAMEL

The single long ciliary nerve in camel is represented by several branches in other domestic animals (GEDINHO and GETTY, 1975). The same authors found that the nasociliary nerve in cattle and sheep as that found in camel, forms the medial branch of the ophthalmic nerve.

According to PRINCE *et al.*, (1960), SEIFERLE (1975) as well as GADINHO and GETTY (1975) the nasociliary nerve divided into ethmoidal and infratrochlear nerves, in dog, pig and ruminants. In horse, the ethmoidal nerve is considered as the direct continuation of the nasociliary nerve. In camel the nasociliary nerve terminates by dividing into ethmoidal and frontal nerves.

The nasociliary nerve of camel detaches both long ciliary nerve and the communicating branch to the ciliary ganglion as described by SEIFERLE (1975) as well as GADINHO and GETTY (1975). However, PRINCE *et al.*, (1960) stated that the nasociliary nerve in cattle gave off only the long ciliary nerve, while the sensory root to the ciliary ganglion was detached from the ophthalmic nerve.

The origin of the zygomaticotemporal branch from the ophthalmic nerve in camel is similar to that in horse ruminants and pig (GEDINHO and GETTY 1971, 1975) but in dog from zygomatic nerve (PRINCE, 1960), and in horse from the lacrimal nerve (BRADLEY 1923).

The origin of the lacrimal nerve from the zygomaticotemporal branch in camel is similar to that reported by GEDINHO and GETTY (1971, 1975) in cattle, sheep, goat and horse.

The communicating branch from the maxillary nerve to the lacrimal nerve mentioned by WINCKLER (1936) in goat, ASHTON and OXNARD (1958) in sheep and ox and by PRINCE *et al.*, (1960) in ox was not demonstrated in the present study, but a communicating branch is observed between lacrimal and zygomatic nerves in 17 examined cases as well as between the lacrimal nerve and zygomaticotemporal branch in 6 cases, and lastly between the lacrimal nerve and nasociliary in 3 specimens.

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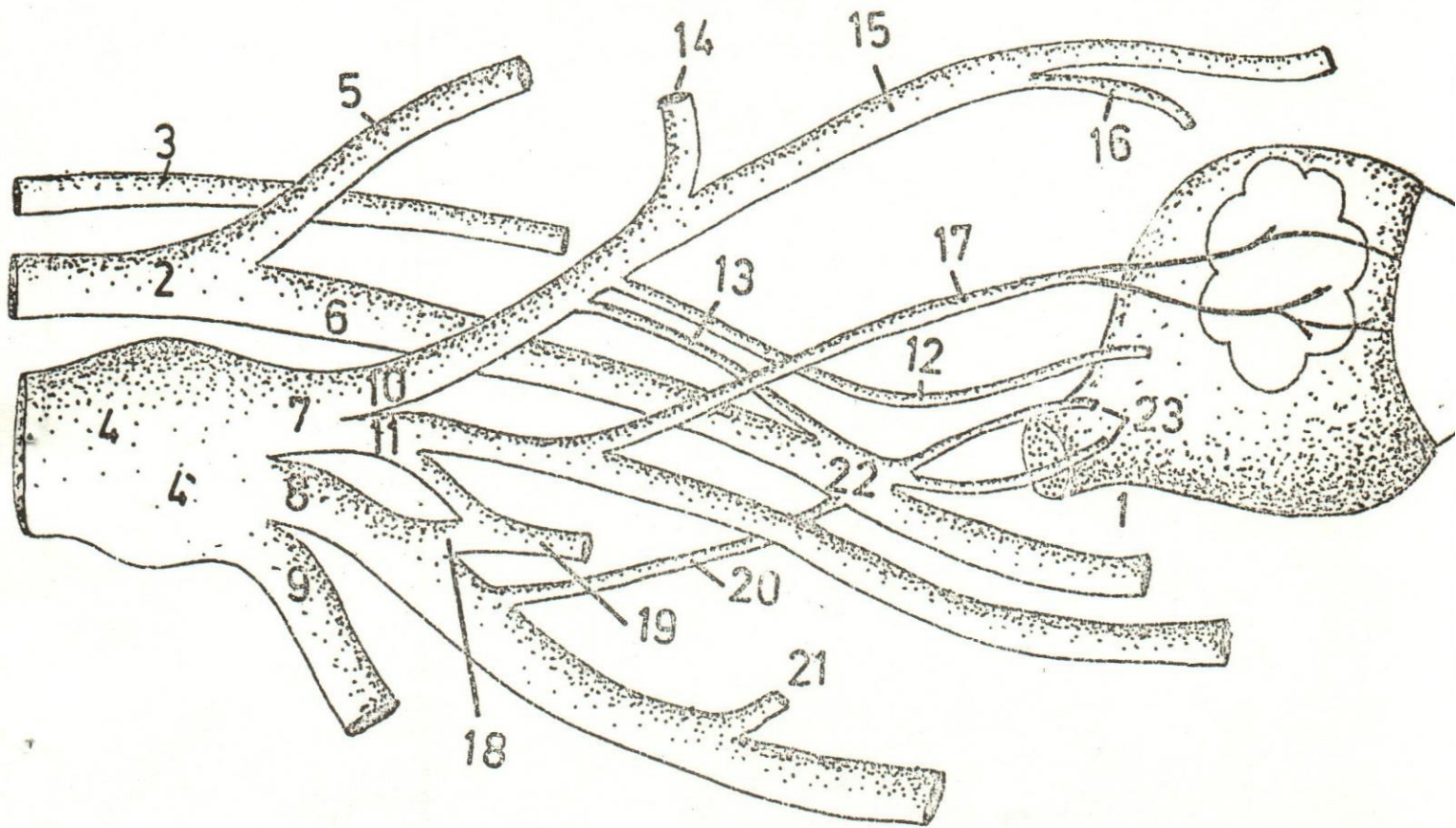


Fig. (1): Diagram showing the distribution of the orbital nerves in camel.

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|--|--|------------------------------|
| 1- N. opticus,                           | 2- N. oculomotorius,                     | 3- N. trochlearis,           |
| 4- N. trigeminus,                        | 4'- Ganglion trigeminale,                | 5- R. dorsalis,              |
| 6- R. ventralis of 2,                    | 7- ophthalmicus,                         | 8- N. maxillaris,            |
| 9- N. mandibularis,                      | 10- N. nasociliaris,                     | 11- R. zygomaticotemporalis, |
| 12- N. ciliaris longus,                  | 13- R. communicans cum ganglio ciliaris, |                              |
| 14- N. ethmoidalis,                      | 15- N. frontalis,                        | 16- N. infratrochlearis,     |
| 17- N. lacrimalis,                       | 18- N. zygomaticus,                      | 19- R. zygomaticofacialis,   |
| 20- R. communicans cum n. oculomotorius, | 21- R. zygomaticofacialis accessorius,   | 22- Ganglion ciliare,        |
|  |  | 23- Nn. ciliares breves.     |

