

# SUPRA-ORBITAL NERVE BLOCK IN DROMEDARY CAMEL (*Camelus dromedarius*)

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## ABSTRACT

The sites for the supraorbital nerve block are controversial. To determine an accurate site, twenty camel heads were used for dissection and 5 apparently healthy camels were used for performing supraorbital nerve block. Results revealed that the supraorbital foramen or canal is absent. The supraorbital nerve passed through the supraorbital notch in the middle of the dorsal orbital rim, and ended directly in the upper eyelid. Supraorbital nerve block was achieved by injection of 4-6 ml of 2% lidocaine at the level of the supraorbital notch.

**Key words:** Camel, dromedary, infratrochlear nerve, orbital fissure, supraorbital nerve block

There are several indications for regional nerve blocks to facilitate the surgery of ocular region in camels. Furthermore, it eliminates the risks that may arise under general anesthesia as bloat and subsequent pulmonary aspiration (Ramadan, 1994).

Eye affections are common in dromedary camels (Fahmy *et al*, 2003; Hegazy *et al*, 2004). In clinical practice, some cases necessitate blocking of the supraorbital nerve, either for accurate diagnosis or surgical interference. Supraorbital nerve block was clinically applied by the first author, at the sites described in the available literatures, but desensitisation of the upper eyelid did not occur.

Early anatomical observations described the presence of at least a pair of supraorbital foramina in the frontal depression at various distances from the midline (Ahmed, 1978 and Ahmed, 1979; Smuts and Benzuidenhout, 1987). Recently, two different locations were described, one of them suggested the frontal location and agreed with the early description (Yahaya *et al*, 2011, and 2014), while the other observations revealed that, the rounded supraorbital foramen common in domestic animals is absent and replaced by a fissure in the orbital rim in camels (Shahid and Kausar, 2005; Monfared, 2013 and Almayahi, 2014).

The present study was aimed to determine an accurate location of the supraorbital nerve exit, using careful dissection for both the orbital and frontal regions in the camel and to standardise the supraorbital nerve block in camels.

## Materials and Methods

Twenty camel heads (15 males, 5 females, aged 3-5 years) obtained from Shebien-Elkanater and Toukh Abattoirs, Qaliobia, Egypt were dissected carefully to study the origin, course, distribution pattern, and the exit of supraorbital nerve. Four of the dissected heads (two of each sex) were selected for preparation of skull specimens using hot-maceration method according to Onwuama (2012). These skulls were used for modeling the course and the exit of the supraorbital nerve, as well as the sites determined by the available literatures, using colored melted foam.

Five apparently healthy camels (3 males, 2 females, aged 3-5 years) were used for performing supraorbital nerve block. Camels were secured in sternal recumbency, the recommended injection site was prepared aseptically, and then 4-6 ml of 2% lidocaine was injected using 1-inch, 22 gauge hypodermic needle. The absence of response to skin clamping at desensitised area and the signs observed after the injection of local anesthetic were recorded.

Nomenclature used in this study was written according to the Illustrated Nomina Anatomica Veterinaria (Schaller, 2011) and Smuts and Benzuidenhout (1987).

## Results and Discussion

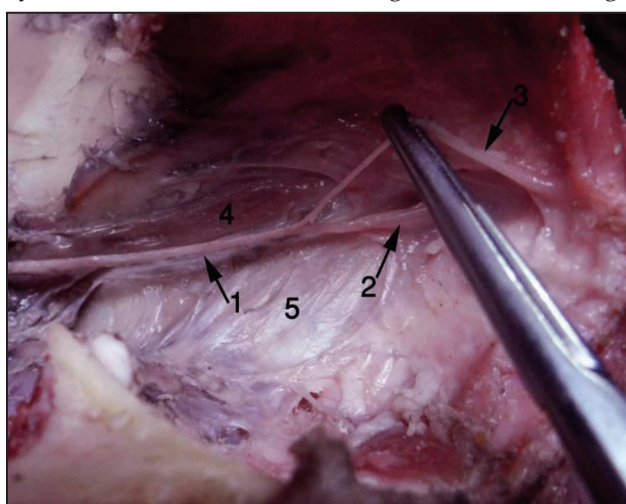
### *Dissection of the frontal nerve:*

The frontal nerve arises from the ophthalmic nerve near the orbito-rotundum foramen. The first

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branch of the frontal nerve penetrates the orbital wall of the frontal sinus as N. sinus frontal. These observations are similar to these found by Ahmed (1979) and Smuts and Benzuidenhout (1987) in camel and Sisson and Grossman (1975) in ruminant.

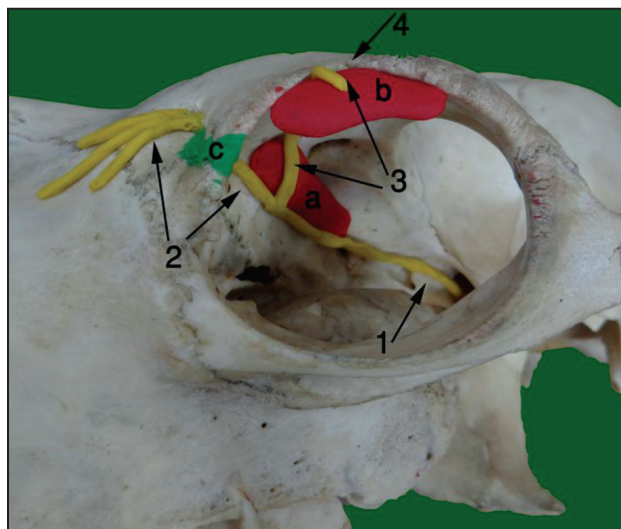
After giving its first branch, the frontal nerve courses rostrad piercing the periorbita ventral to the medial rectus muscle (Fig 1). Near the medial orbital angle, the frontal nerve curves and gives the infratrochlear nerve, which left the orbital cavity through the infratrochlear fissures (Figs 1-4). The infratrochlear nerve is divided into several twigs, which supply the skin of the medial canthus of the eye, in addition to the frontal region. These findings



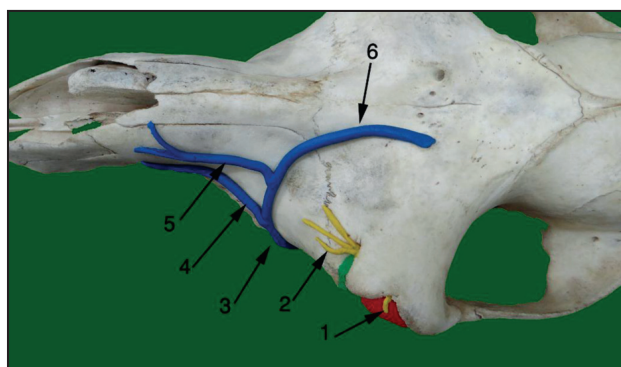
**Fig 1.** Dissection showing the frontal nerve (1), the infratrochlear nerve enters the infratrochlear fissure (2), the supraorbital nerve ends in the subcutaneous fascia of the upper eyelid (3), the medial rectus muscle (4), and the orbit (5).



**Fig 2.** Skull showing the frontal site which described by most literatures for the supraorbital foramina (1), the infratrochlear fissure (incisora) or the orbital fissure (2), and the supraorbital notch, a shallow notch near the middle of the dorsal orbital rim (3).



**Fig 3.** Skull showing the frontal nerve (1), the infratrochlear nerve (2) the supraorbital nerve (3), the supraorbital notch (4), the medial rectus muscle (a), the upper eyelid (b), the cartilage filled the infratrochlear fissure (c).



**Fig 4.** Skull showing the supraorbital nerve (1), the infratrochlear nerve (2) the facial vein (3), the lateral nasal vein (4), the dorsal nasal vein (5), the frontal vien (6).



**Fig 5.** Camel head showing the insertion of 1-inch, 22 gauge hypodermic needle subcutaneously at the level of the supra-orbital notch for SPN blockade, the desensitised area was highlighted.



were in agreement with those described by Ahmed (1979) and Smuts and Benzuidenhout (1987) in camel, and disagreed with Shahid and Kausar (2005), Monfared (2013) and Almayahi (2014) who reported that the infratrochlear fissures (orbital fissures) were the exit of the supraorbital nerve.

The supraorbital nerve (SPN) continues the course of the frontal nerve (Figs 1, 3), and proceeds rostrorodorsally within the periorbita to reach the dorsal border of the orbital rim, and at the level of the supraorbital notch it pierces the skin of the upper lid directly (Figs 1, 2, 3). In most of the available studies which concerned the SPN in the dromedary, the dissection of the nerve could not be followed completely, in addition, these studies considered the site of the SPN block where the supraorbital foramen (SF) was present (Ahmed, 1978; Yahaya *et al*, 2011 and 2014). In contrast, the results of this research were revealed that the SPN has no foramen of exit, as it ended directly in the upper eyelid. In this respect, the SPN of dromedary is slightly similar to the SPN in the dog and cat (Sisson and Grossman, 1975; Dyce *et al*, 1996; Esteves *et al*, 2009).

Smuts and Benzuidenhout (1987), Yahaya *et al* (2011) and (2014) described that the supraorbital foramina (SF) was located in the frontal region near the midline. The dissection of all specimens in this study revealed that these foramina were the exit of the frontal veins, and no nerve passed across these foramina (Figs 2, 4). It was suggested that the previous description was totally misleading, as it considered the camel skull similar to the other ruminant skull, and ignored the dissection of SPN as well as the peculiarities of camel anatomy.

#### **Supra-orbital nerve block:**

The supraorbital notch was palpated near the middle of the dorsal orbital rim (Figs 2, 3, 5). After thorough pre-operative care 1-inch, 22 gauge hypodermic needle was inserted subcutaneously in a slight medial direction at the level of the supra-orbital notch (Fig 5), and then 4-6 ml of 2% lidocaine was injected. The analgesic action took place in 10 minutes after injection and the eyelids were desensitized for 30 minutes.

These procedures were completely different from those described by Ahmed (1978) and the site for needle insertion differed from that described by Ahmed (1979), Smuts and Benzuidenhout (1987), Yahaya *et al* (2011) and Yahaya *et al* (2014). They described a site 3 cm from the midline in the frontal region, but desensitisation of the skin of the upper eyelid could not be achieved by injection at this

site as local anaesthetic got deposited around the frontal vein. The site determined in this study also differed from that described by Shahid and Kausar (2005), Monfared (2013) and Almayahi (2014) as they suggested the orbital fissure to be the true exit of the SPN. Injection at the previously mentioned site desensitized the skin around the medial canthus of the eye and the adjacent skin of the frontal region as the infratrochlear nerve was blocked instead of SPN, these findings were in agreement with those reported by Ahmed (1978) and Ahmed (1979).

#### **Conclusion**

The supraorbital nerve (SPN) continues the course of the frontal nerve rostrorodorsally. At the level of the supraorbital notch it ends directly in the skin of the upper eyelid. The supraorbital foramen or canal is absent. The foramina near the midline are for the passage of the frontal veins, not for the SPN. In addition, the orbital fissure (infratrochlear fissure) was the exit of the infratrochlear nerve, not the SPN. On basis of the results of this study SPN block could be reached by injection of 4-6 ml of 2% lidocaine at the level of the supraorbital notch.

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