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ORBITAL VENOGRAPHY IN GOAT (With 2 Figures)

By

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تصوير أوردة تجريف الججاج بالأشعة في الماعز

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تم حقن مادة معتمة للأشعة (يوروجرافين ٧٦٪) في ماعز لتوضيح الأوردة داخل الججاج وذلك بعد فتح الجلد وتركيب إبرة حقن داخل وريد زاوية العين . وقد ظهرت الأوردة في جميع الصور الأخذة بوضوح في الوضعين الجانبي والعلوي سفلي.

SUMMARY

Contrast radiographic study of the normal orbital veins was performed in eight goats. The contrast medium (urogratin 76%) was injected into the angularis oculi vein after skin cutdown and vein cannulation.

The orbital veins were well outlined in all venograms, in dorsal and lateral projections.

INTRODUCTION

Radiographic contrast studies are one of the most valuable diagnostic procedures for diseases of the orbit. In addition to the complete ophthalmic examination and survey or scout radiographs, especial orbital radiographic contrast techniques include arteriography and venography of the orbital blood vessels as well as a direct injection of radio-dense or radiolucent materials into the orbit are especially valuable (GELATT, 1981 and SLATTER, 1981).

The investigation of orbital space-occupying lesions in man by filling the superior ophthalmic veins with contrast medium from an injection into the angular vein either by cutdown or percutaneous puncture, was first described by DEJEAN and BOUDET (1951) and YASARGIL (1957). This method has largely been superseded by the method of frontal vein injection which originally described by VRITOSIOS (1961), where the orbital venograph of both sides can be studied in one injection of contrast medium.

In dogs, techniques to outline the orbital arteries and veins were performed either secondary to the cranial vasculature (OLIVER, 1969 and GRIFFITHS & LEE, 1971), or by regional contrast procedures of the orbital vasculature by injection of contrast

medium into the infraorbital artery and vein, or the angularis oculi vein (GELATT *et al.*, 1970 and CARTER, 1972).

Diseases of the orbit for which radiography is an important diagnostic procedure include: congenital bony malformations, regional and diffuse inflammations, vascular abnormalities (displacement, compression or collapse of some veins) and neoplasms. Orbital arteriography and venography are useful to detect alterations, deviations and vascular proliferations which usually associated with neoplasms (GELATT, 1981 and SLATTER, 1981). RUBIN and PATTERSON (1965) used orbital angiography in the diagnosis of arterio-venous fistula of the orbit in dog.

The majority of space-occupying lesions in the orbit are demonstrated by venous displacement, and the type of displacement may indicate the location of the lesion in orbit -for example-whether it is intra- or extraconal (LIOYD, 1976). KERN (1985) used the orbital sinus venography to demonstrate the abnormal orbital vasculature, especially in soft-tissue origin tumours in 23 dogs after skull radiography did not satisfactorily delineate the nature or extent of the orbital neoplasm.

In the available literatures, the normal orbital contrast radiographic appearance of the blood vessels in goat has been not described. Therefore, it was decided to study the normal radiographic visualization of the venous pattern of the orbit in goat.

MATERIAL and METHODS

Eight goats of native breed from 3 to 5-year-old were used in this study. Venography was performed in both sides in each animal. The animal was anaesthetized with Ketamine*, intravenously in a dose rate of 11 mg/Kg B.W. and premedicated with intramuscular xylazine** in a dose rate of 0.2 mg/Kg. B.W. The animal was placed with the head in lateral recumbency and the neck was extended. Two techniques for the orbital venography have been tested. The first technique select the infraorbital vein and the second one select the angularis oculi vein for injection of the contrast medium (GELATT *et al.*, 1970; CARTER, 1972 and TIGER, 1984). The area for angularis oculi venography (about 3-4 cm in diameter) around the medial canthus of the eye and for infraorbital venography at the level of infraorbital foramen were prepared for surgery.

The skin was incised over the course of angularis oculi vein, the subcutaneous fascia was bluntly separated to expose the vein. A segment of the vein approximately 1.5 cm long is isolated and elevated with one length of non-absorbable suture material. The vein was then cannulated in a proximal direction with a 21-gauge Butterfly infusion set***, and the needle is tied into place with the previously placed ligature and another stitch was made into the skin to prevent the movement of the Butterfly needle (Fig. 1).

*: Ketalar, Parke-Davis & Co., U.S.A.

** : Rompun, Registered trademark of Bayer AG, Leverkusen.

***: Bortoni Nello, S.R.L. Italy.

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Heparinized physiologic saline solution was used to flush the needle and tubing periodically to prevent clotting and to maintain patency. A tourniquet of thin rubber tube was applied around the neck just anterior to the wings of the atlas to occlude the jugular vein.

Ascending doses of contrast medium (urografin 76%) starting by 5 ml was injected until complete visualization of the orbital veins. The contrast medium was injected with moderate pressure to produce retrograde flow into the vein. A lateral radiograph was produced near the end of the injection period. The injection and radiographic procedures were repeated in the dorsal projection. Radiographic exposure factors used were 6 mAs and 50 Kv.

The cannula was then removed and moderate digital pressure was applied to the vein for a short time. The skin incision was closed in a routine manner.

RESULTS

Are presented in Figures (1 & 2).

DISCUSSION

The procedures of venography into the angularis oculi vein which used in this study was more easily, superficial and safer than the infraorbital vein. The later vein is deeply situated and related to the infraorbital artery and nerve which may injured during the dissection of the vein.

The skin cutdown for cannulation of the vein was more preferable than percutaneous puncture, where the cannula had been placed and ligated inside the vein to guarantee that the contrast medium not diffused subcutaneously outside the vein.

The orbital venous system was well defined and the number of veins completely visualized by injection of 10 ml of contrast medium. The structures that were visible in a normal venographs are shown in (Fig. 2). The ophthalmic venous plexus, which consists of the dorsal and ventral external ophthalmic veins, was clearly outlined. The dorsal external ophthalmic vein was demonstrated and joined with angularis oculi vein. The v. emissaria foraminis orbitotundi was defined at its origin from the external dorsal ophthalmic vein. The external ethmoidal vein, which leaves also the ophthalmic venous plexus was frequently defined.

The venous distribution of the orbit after venography through the angularis oculi vein in our study are nearly similar to that stated by WILKENS and MUNSTER (1981).

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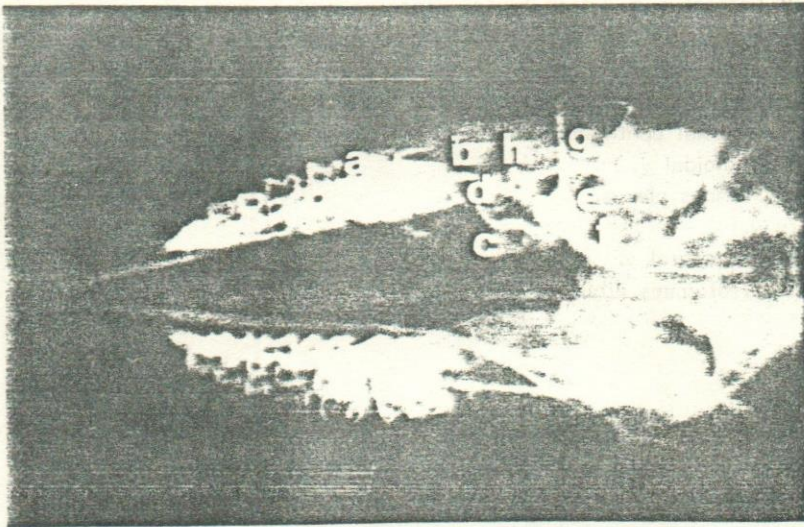
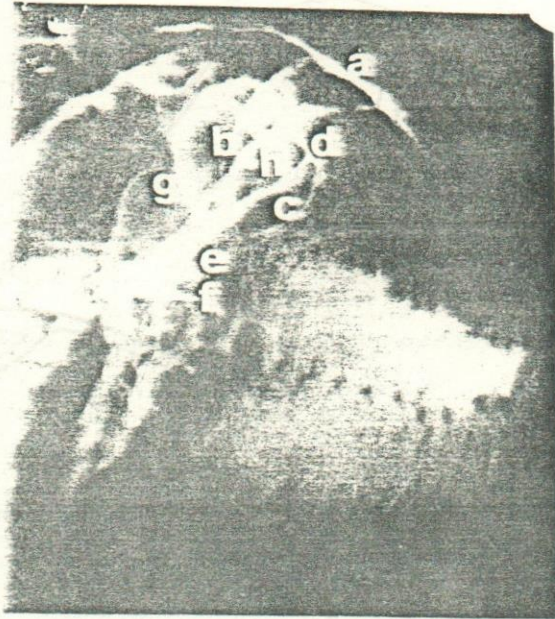
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Fig. (1): Method of injection used for orbital venography. The butterfly set introduced and fixed in the angularis oculi vein of a goat.

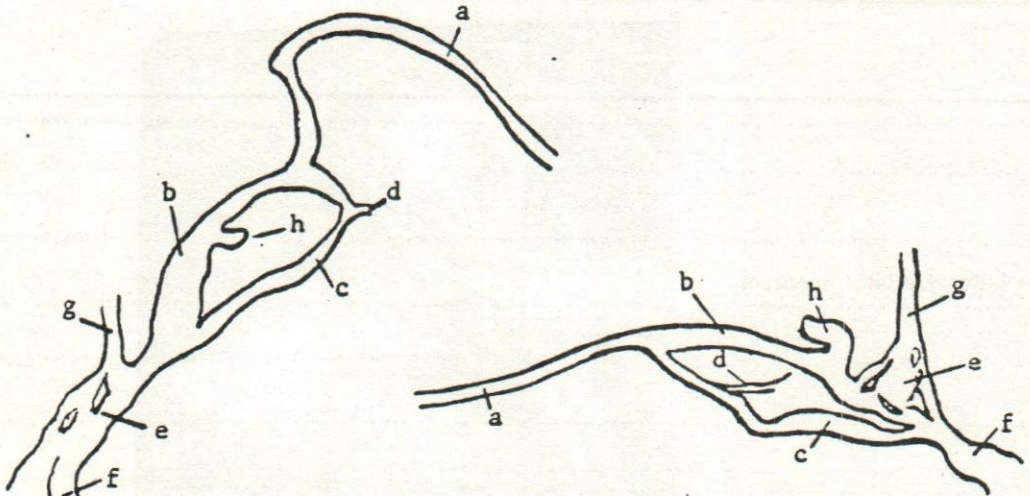
Fig. 2

A- Lateral orbital venogram.



B- Dorsal orbital venogram.

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C- Diagram of lateral orbital venogram.

D-- Diagram of dorsal orbital venogram.

Fig. (2): Lateral and dorsal orbital venograms of a goat. Radiographs were produced after a retrograde injection of contrast medium into the angularis oculi vein.

- a- Angularis oculi v.
- b- Dorsal external ophthalmic v.
- c- Ventral external ophthalmic v.
- d- External ethmoidal v.
- e- Pterygoid venous plexus.
- f- Maxillary v.
- g- Superficial temporal v.
- h- V.emissaria foraminis orbitorotundi.