A TECHNIQUE FOR A WIDE APPROACH TO THE MEDULLA AND BULLAE OF THE CAT

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INTRODUCTION

Ready access to the bullae and auditory pathways in the medulla can only be achieved by the ventral approach. A wider exposure is required than for approaches to other structures in the medulla, such as the trigeminal nuclei and pyramidal tracts. In our neurophysiological experiments it was frequently necessary to use three electrodes to stimulate and record from the auditory pathways in the medulla. To accommodate these electrodes in the medulla and operative field at the one time, wider access was needed than provided by the standard approach described by Boudreau and Rohwer (1964). In their approach the tissues were dissected lateral to the larynx so that it could be retracted to one side, but we were able to obtain a wider approach by mobilization of the larynx and pharynx, division of their supporting structures, ligation of one common carotid artery, and incision of the larynx and pharynx. The anatomical terminology used in the description of this method is from Reighard and Jennings, 1966.

METHOD

An incision was made from a point about an inch below the left external auditory meatus across the upper part of the neck in a cephalic direction to a point midway along the right horizontal ramus of the mandible (Fig. 1A). The incision was deepened through the subcutaneous tissue and the common facial vein ligated and divided. The submandibular salivary gland was excised and the facial artery ligated beneath this structure (Fig. 2). The anterior portion of the digastric muscle was then isolated, ligated and divided. This muscle was dissected laterally to its insertion into the occipital bone above the left bulla. Care was taken to dissect close to the muscle to avoid injury to the left common carotid artery and internal jugular vein. For wide access it was sometimes necessary to ligate and divide the common carotid artery and internal jugular vein on the left side. The greater horn of the hyoid bone is isolated and divided on the lateral wall of the larynx. This structure with its attached muscles is dissected laterally and excised.

The muscles on the front of the larynx, and in particular the thyrohyoid muscles, were identified. The thyrohyoid muscles were then incised and the larynx opened between the hyoid bone and thyroid cartilage. (Fig. 3). The mucosa of the pharynx was then incised circumferentially and a retractor inserted. A very good view of both bullae and longus capitis muscles was obtained. The bullae were cleaned and the longus capitis muscle divided between them. The muscle was then elevated, exposing a wide area of the
Fig. 1  A. Incision for the Ventral Approach to the Medulla.  
B. Exposure of Basi-occiput and Auditory Bullae.

Surgical Approach to Cat Medulla and Bullae

Fig. 2 Dissection of Superficial Structures.

Fig. 3 Exposure of Posterior Pharyngeal Wall.


Note: The dotted line indicates the site of the incision in the posterior pharyngeal wall to expose the baso-occiput.
basilar part of the occipital bone from the foramen magnum to the sphenoid bone. (Fig. 1B). The desired area of bone was then drilled away exposing dura mater. The dura and arachnoid mater were then incised and reflected, and the medulla exposed for electrode penetration.

DISCUSSION

This ventral approach gave excellent access to the medulla and auditory bullae. A large area of the medulla could be exposed by removing the overlying bone with a dental burr. Forward exposure was limited by bleeding from the basilar venous sinus while lateral exposure in the angle between the bulla and occipital bone was impaired by bleeding from the inferior petrosal sinus. This approach was very satisfactory for the trapezoid body, superior olivary complex and lateral lemniscus, and was sometimes used to record from or stimulate the inferior colliculus of olivo-cochlear bundle. Furthermore access could be gained to the inferior olive and to the trigeminal nuclei.

Furthermore, access to the round windows and middle ear muscles was satisfactory, and a bilateral exposure of the bullae could be performed through the one incision. Further advantages over a dorsal approach were that the nuclei and tracts were closer to the surface, and this permitted the more accurate placement of electrodes, particularly glass and tungsten ones.

SUMMARY

A wide access was necessary when recording from and stimulating the auditory pathways of the medulla. An operative approach achieving such a wide access has been described. This approach allowed access by the exposure and mobilisation of the larynx and pharynx, which were then divided circumferentially at the level of the hyoid bone.

ACKNOWLEDGEMENTS

The National Health and Medical Research Council of Australia provided funds for this work.

We would like to thank Miss J. Harvey, Miss R. Swan and Mr. E. Foster for technical, typing and photographic assistance.

REFERENCES

Minerva Access is the Institutional Repository of The University of Melbourne

Author/s:
Clark, Graeme M.; Dunlop, Colin W.

Title:
A technique for a wide approach to the medulla and bullae of the cat

Date:
1969

Citation:

Persistent Link:
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