

# **Introduction**

It is challenging to surgically access the lateral recess of the 4th ventricle. Currently existing surgical approaches to this region entail cerebellar tonsillar retraction and steep trajectories parallel to the axis of the brainstem, thereby providing suboptimal access.

This report aims to (i) describe the surgical anatomy of the tonsillo-biventral fissure approach to the lateral recess of the 4th ventricle, and (ii) to assess the feasibility of this trajectory for exposing and gaining surgical access to this region.

# **Methods**

The anatomical relationships of the lateral recess of the fourth ventricle were studied in two formaldehyde-fixed cerebella. In addition, four human cadaveric specimens were used for performing surgical simulation of the tonsillo-biventral fissure approach via a lateral suboccipital craniotomy.

# **Results**

The key landmarks for identifying the tonsillo-biventral fissure included the pattern of the cerebellar folia and the cortical branches of the posterior inferior cerebellar artery. Splitting the tonsillo-biventral fissure allowed a direct and safe surgical trajectory to the lateral recess of the fourth ventricle, across the cerebello-pontine cistern. The proposed approach optimizes the surgical angle of attack and is also ergonomically superior as it reduces cervical flexion.

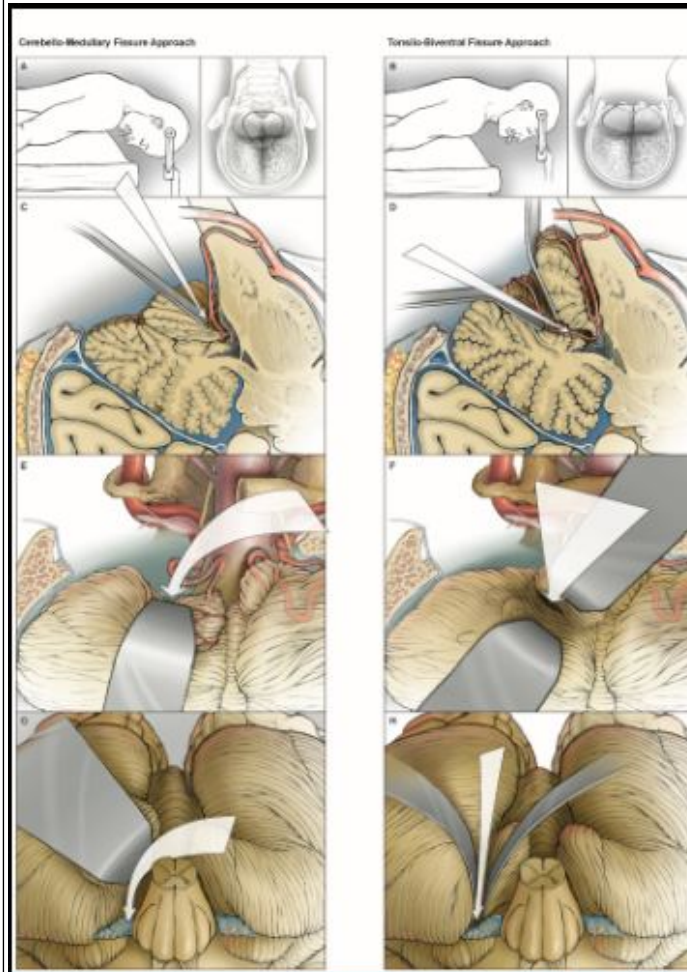
# **Conclusions**

The tonsillo-biventral fissure approach is a feasible and effective surgical option for exposing the lateral recess of fourth ventricle. This approach provides a better surgical trajectory and is more ergonomic both for the patient and the surgeon, in terms of positioning.



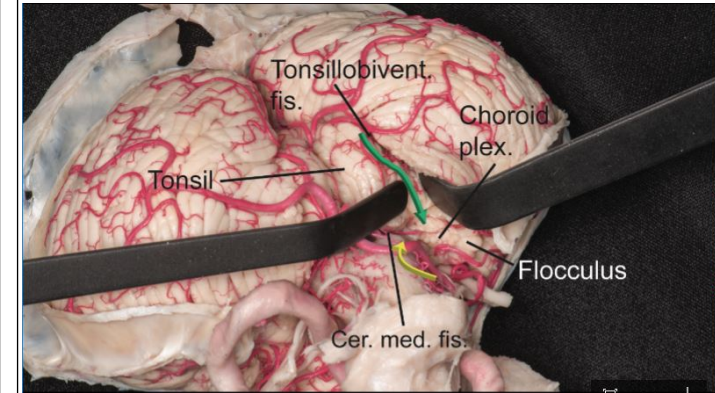
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**Figure 1**



Schematic illustration and comparison of cerebello-medullary fissure and tonsillo-biventral fissure approaches to lateral recess of the 4th ventricle

**Figure 2**



Supra-tonsillar approach. Right tonsillo-biventral fissure is split to show the trajectory to the lateral recess of the fourth ventricle

# **Learning Objectives**

By the conclusion of this session, participants should be able to:

- 1) Understand the surgical trajectories to the Lateral Recess of the 4th ventricle
- 2) Learn the key differences between the cerebello-medullary fissure and tonsillo-biventral fissure approaches to lateral recess of the 4th ventricle
- 3) Describe the main surgical risks of the classic telovelar approach to the lateral recess (e.g. inadvertant damage to PICA perforators)
- 4) Identify the key anatomical landmarks for the identification and safe opening of the tonsillobiventral fissure