

Introduction

The ambient cistern is an arachnoid complex that extends from crural cistern to lateral border of cerebral colliculi. The subtemporal approach has been recognized as the best access to reach pathologies in the ambient cistern, however many disadvantages exists. The present work aims to analyze quantitatively the area of exposure provided by the subtemporal access. The objective is to evaluate if there are advantages of using the neuroendoscope in conventional subtemporal access when compared to the subtemporal access with resection of the parahippocampal gyrus.

Learning Objectives

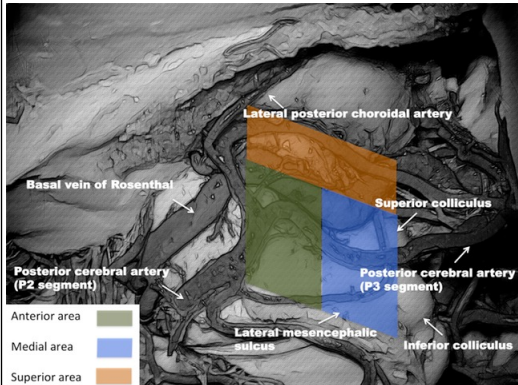
- 1) Evaluate advantages of an endoscopic approach to the temporal region;
- 2) Identify a wider surgical exposure with parahyppocampal gyrus removal in the subtemporal approach to the ambient cistern

Methods

A subtemporal approach was performed in six brain hemispheres. The quantitative analysis was perfomed using stereotactic localization system Optotrak 3020 (Nothern Digital Inc., Waterloo, ON, Canada). First variables analyzed were the extent of exposure of some targets such as the posterior cerebral artery, posteromedial choroidal artery, and basal Rosenthal vein. The area of surgical exposure was also quantified and it was divided into three components: anterior, medial, superior (Figure 1). Those variables were analyzed by conventional

and the modifications in the areas of microsurgical exposure were quantified. Differences in the linear exposure and area of exposure were performed with the t-Student's test.

Figure 1- Area of surgical exposure divided into three regions



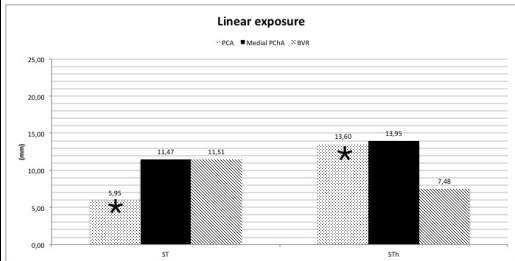
Green - Anterior area: lateral to the cerebral peduncle to the lateral mesencephalic sulcus / Blue - Medial area: adjacent to the midbrain and posterior to the lateral mesencephalic groove / Orange - Superior area: "roof" of the ambient cistern, which corresponds to the pulvinar of the thalamus, lateral geniculate body and optic tract

Results

The linear exposure to the posterior cerebral artery was 5.95 for subtemporal access (ST) and 13.6 for subtemporal access with resection of the parahippocampal gyrus (STh) (p=0.019). The total exposure area was 104.8mm2 for ST and 210.5 for STh (p=0.0001). Regarding to endoscope assistance the medial area, ST was 81.0mm2 and STend was 176.2mm2 (p=0.038).

For the total area of exposure, we obtained a value of 210.5mm2 for ST and a value of 391.3mm2 for STend (p=0.041).

Figure 2- Linear Exposure of anatomical landmarks in the ambient cistern



*The STh provided wider exposure of the PCA compared to the conventional ST

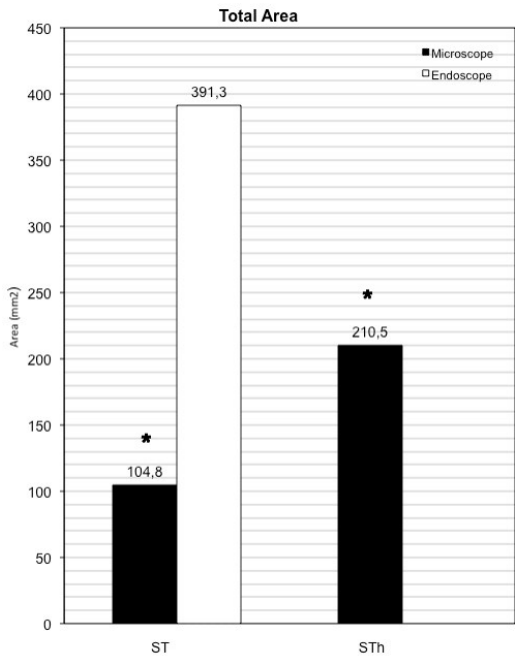
Conclusions

In conventional subtemporal access, the use of the neuroendoscopes avoids the need for resection of the parahippocampal gyrus for better visualization of the ambient cistern structures.

References

- 1- Figueiredo EG, Beer-Furlan A, Welling LC, Ribas EC, Schafranski M, Crawford N, et al. Microsurgical Approaches to the Ambient Cistern Region: An Anatomic and Qualitative Study. World Neurosurg. 2016;87:584-590.
- 2- Figueiredo EG, Beer-Furlan A, Nakaji P, Crawford N, Welling LC, Ribas EC, et al. The Role of Endoscopic Assistance in Ambient Cistern Surgery: Analysis of Four Surgical Approaches. World Neurosurg. 2015 ;84(6):1907-1915.

Figure 3- Total area of surgical exposure of the ambien



*STh provided advantages in the exposed area in the microsurgical technique. The neuroendoscope allowed wider exposure of all compartments of the ambient cistern / For the medial component and the total area of visualization, it is observed that the neuroendoscope allows a more significant wide exposure than that provided by the resection of the parahippocampal gyrus.