# Robotic Surgery of the Fourth Ventricle A Cadaveric Study

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CNS 2018 ANNUAL MEETING HOUSTON, TEXAS OCTOBER 6-10, 2018

## Introduction

The goal of this study was to determine the viability and limitations of the da Vinci surgical robot in posterior fourth ventricle approaches.

## Methods

The da Vinci Surgical System was utilized in four cadaver heads by the neurosurgeons familiar with the posterior fourth ventricle approach, mainly the telovelar. The procedure was conducted step by step on the cadaveric specimens using the da Vinci Surgical System and results were observed.

## Learning Objectives

The study investigates the introduction of the robotic systems into neurosurgery. Both the approaches suitable for the system and the system's limitations and possible improvements are investigated. The participants will be able to 1) Learn how the system can be implemented in the fourth ventricle approach 2) Able to investigate possible varieties of the approach 3) Learn more about the system's limitations.

**Endoscopic Image 1**

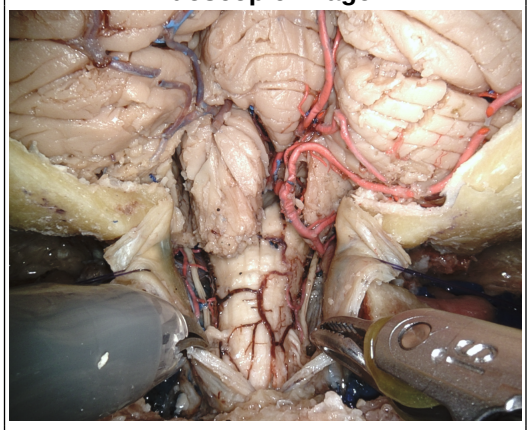

Image captured by the da Vinci system. Access to the Brain Stem.

## Conclusions

The findings suggest that fourth ventricle robotic surgery, with the da Vinci robot system, holds great potential for resection of tumors of this region, due to providing the surgeons with a more comfortable working position. Another advantage of this technique is the lowered risk of air embolism of the sitting position. Further instrument development is necessary however for increased haptic feedback and possibly more tools suited to neurosurgery mainly the drills.

**Endoscopic Image 2**

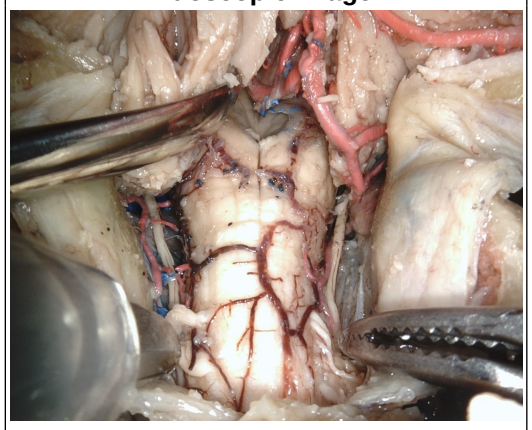

Image Captured by the da Vinci system. Example of lateral exposure.

## Results

The main advantage of the system to be found was that the approach could be conducted with the patient in prone position, opposing to the more commonly used sitting position. The system provided great illumination and 3d perception at the comfort of the console.

**Endoscopic Image 3**

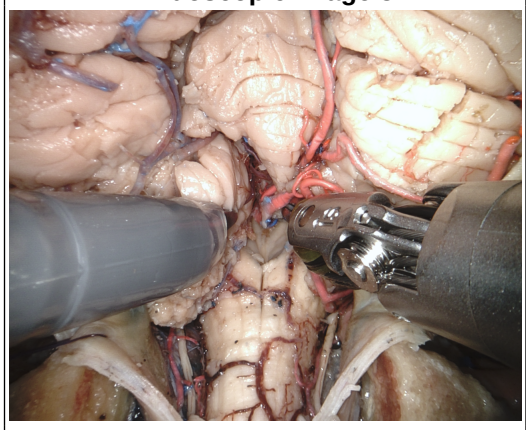

Image captured by the da Vinci system. Visualisation of the brain stem and the fourth ventricle.

## References

1. Lee, John YK, et al. "Transoral robotic surgery of craniocervical junction and atlantoaxial spine: a cadaveric study." Journal of Neurosurgery: Spine 12.1 (2010): 13-18.

2. Marcus, Hani J., et al. "da Vinci robot-assisted keyhole neurosurgery: a cadaver study on feasibility and safety." Neurosurgical review 38.2 (2015): 367-371.