

# A New Revascularization Technique for Treatment of Complex Skull Base Lesions Using a Minimally-Invasive Keyhole Approach.

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## Introduction

The authors conducted a microanatomical cadaver study to explore the possibility to access the skull base through a minimally-invasive keyhole approach through the pterygoid fossa. The minimally-invasive interpositional ICA bypass technique presented by the authors offers an elegant, minimally-invasive method of cerebral revascularization in complex cases involving the skull base and requiring ICA occlusion

## Methods

We conducted this anatomical study on 15 cadavers, meaning a total of 30 approaches over a period of two years. Standard neck dissection and subtemporal pterional mini-craniotomy, approx. 2x2 cm (08x0,8 inches), were performed, the previously harvested interposition bypass graft intracranially placed through a keyhole in the pterygoid fossa. High-flow revascularization was achieved by anastomosing the graft vessel between cervical (neck dissection) and supraclinoid (mini-craniotomy) C3-6 ICA or MCA.

## Results

The presented technique leads to a smaller and less invasive craniotomy compared to the standardized standard pterional craniotomy and total removal of the temporal bone. Our recommended minimally-invasive bypass technique circumvents the need of longer grafts and avoids more brain traction using CSF draining technique and superficial grafts with a subfascial exposure of the anastomosis, eventually holding a higher risk of morbidity and occlusion rates.

## Conclusions

The aim of this study was to evaluate this new approach as a potentially more time-efficient intervention, less traumatic procedure for the patient and last but not least, a higher patency rate of technically demanding high-flow bypass grafts.

## Learning Objectives

The presented anterograde cervical-to-ICA revascularization method represents an alternative to the established, more invasive interventions. Those standard techniques, such as the transzygomatic extended middle fossa approach, published by Fukushima et al., or the petrous-to-supraclinoid interpositional bypass, published by Spetzler et al., require the performance of two intracranial anastomoses in technically challenging, small working space, with an associated prolonged temporary occlusion time of the ICA.

## Pterygoid Fossa Keyhole for Vascular Graft

