INSTRUMENTATION: SKULL BASE

# Cranio-Orbital Approach and Decompression of the Optic Nerves: A 2-Stage, 4-by-4-Step Approach to Improve Vision in Sellar and Parasellar Lesions

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## Abstract

### BACKGROUND AND OBJECTIVES:

Despite advances in cranial base techniques, surgery of the sellar and parasellar regions remains challenging because of complex neurovascular relationships. Lesions within this region frequently present with progressive visual deterioration caused by distortion and compression of the optic chiasm and nerves. In addition to the direct mass effect from mechanical forces acting on the optic apparatus, these lesions alter blood supply and reduce vascular perfusion, prompting surgical treatment to remove the lesion, alleviate compression, and improve blood flow to the optic nerve. We sought to describe a 2-stage, 4-by-4-step approach, broken down and described as a “four-by-four” technique for optic apparatus decompression and a wide approach to different sellar and parasellar lesions.

### METHODS:

We describe the operative nuances and key anatomic points in the microsurgical removal of sellar and parasellar lesions. The technique is illustrated with examples of different cases with pre- and follow-up MRI imaging and a brief overview of visual outcomes.

### RESULTS:

The described technique has been demonstrated in various lesions in 5 patients. Patients presented with bilateral visual loss in 4 (80.0%) cases and with unilateral visual loss in 1 (20.0%) case. Improvement in visual function was noted in all cases, confirmed with visual acuity and visual field testing.

## DISCUSSION:

The transcranial approach (“from above”) remains an important surgical option for patients with excellent exposure and visualization of the sellar and parasellar regions. It permits early access to the optic canal for careful microsurgical decompression and relaxation of the optic nerve to preserve and improve its microvascularization and ultimately vision.

## CONCLUSION:

The authors augmented the 2-stage, 4-by-4-step technique of decompression with elaborate illustrations of diverse sellar and parasellar lesions to demonstrate the versatility of this approach.