# 13. MINIMALLY INVASIVE TREATMENT OF PITUITARY ADENOMAS

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**Introduction**. Pituitary adenomas (PAs) are among the most common tumors of the central nervous system, frequently diagnosed in the third and fourth decades of life. Despite their benign classification, PAs can result in significant morbidity and mortality due to excessive hormonal secretion, hypopituitarism, or mass effect. Minimally invasive approaches have become the gold standard in PAs surgery, offering expedited clinical outcomes and facilitating a quicker return to daily activities for patients.

**Aim of study**. This study aims to critically evaluate the role of minimally invasive surgery in the treatment of pituitary adenomas, emphasizing patient outcomes and recovery..

**Methods and materials.** This article synthesizes data from international peer-reviewed publications and authoritative online resources. A thorough review of recent literature, including systematic reviews and meta-analyses, was conducted to gather the latest evidence in this field.

**Results.** Pituitary adenomas are predominantly benign, and a comprehensive analysis of imaging and laboratory results guides the treatment pathway. The treatment for confirmed PAs is determined based on tumor size, clinical presentation, and whether the adenoma is functioning or non-functioning. The primary treatments are medication, surgery, and radiation therapy. Medication and radiation are typically reserved for specific cases or as adjuncts, with surgery remaining the preferred approach. Surgical goals include alleviating the tumor's mass effect while preserving hormonal function. Transsphenoidal surgery (TSS), either via a microsurgical or endoscopic approach, is the most common minimally invasive technique. The transcranial approach is limited to large, invasive tumors not amenable to TSS. Minimally invasive access is well-received by patients, leading to better postoperative outcomes and psychological recovery. Perioperative complications and endocrine imbalances are less frequent with TSS compared to traditional approaches, leading to shorter hospital stays and faster resumption of daily activities.

**Conclusion.** Minimally invasive treatment of pituitary adenomas, particularly transsphenoidal surgery, demonstrates superior outcomes compared to traditional surgical methods, with reduced hospitalization and enhanced patient compliance with follow-up treatments. For optimal results, TSS should be performed by experienced neurosurgeons in coordination with a multidisciplinary medical team.

**Keywords.** Pituitary adenomas, treatment, transsphenoidal surgery.