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Autor(en) des Beitrags: Buchfelder, M; Kreutzer, J

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Abstract: Following a century of evolution and refinements in standard surgical techniques, the vast majority of operations for pituitary adenoma to date are performed utilizing transsphenoidal approaches. From current large series one obtains the impression that certainly less than 10% of these tumors require craniotomies. However, still several tumors, which’s volume is mainly localized outside of the sella require transcranial approaches, of which the pterional and subfrontal routes are the most widely used. The goal of surgical treatment is rapid eradication of the tumor mass, decompression of visual pathways and elimination of hormonal oversecretion whilst preserving the normal gland and avoiding potential surgical complications. Even with microsurgical techniques and standardized approaches, there is still some mortality associated with transcranial approaches and morbidity is undoubtly higher than with transsphenoidal operations. However, a selection bias must be considered, which shifts tumors with a larger size, less favourable prognosis and higher complication rate into the transcranial series. Moreover, with extended transsphenoidal approaches, lesions have become accessible for transsphenoidal surgery, which previously have been considered as contraindications. In this article current indications and limitations for transcranial surgery of pituitary adenomas, the preoperative workup, surgical techniques, results, and complications are briefly reviewed.