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Outcomes of Surgically treated Pituitary Adenomas in Malta – A Population-Based Study

Jessica Mangion [1,2], Miriam Giordano Imbroll [1,2], Josanne Vassallo [1,2] & Mark Gruppetta [1,2]

Aim: The sequelae of surgically treated pituitary adenomas (PAs) is an important area of study to help guide management. Our study aims to analyse all PAs, functional and non-functional, which were operated until the end of 2022 in a well-defined population and to identify radiological characteristics that can predict recurrence before operation.

Methods: 206 PAs were evaluated along with their clinical, radiological, and histopathological characteristics. The clinical records of operated patients attending the only central national health service hospital in Malta were retrospectively analysed. Detailed clinical and histopathological data were obtained for each patient. The preoperative MR scan of each patient was analysed, and its radiological size, intensity patterns, suprasellar and infrasellar extension, and lateral extension were recorded. Univariate and multivariate analyses were done to establish the association of different variables and which variables can predict recurrence after operation.

Results: 107 (51.9%) patients had a non-functional pituitary adenoma (NFPA), 20 (9.7%) had an ACTH-secreting PA, 68 (33%) had a GH-secreting PA, 10 (4.9%) had a prolactinoma and 1 (0.5%) had a TSH-secreting PA. The median age was 49 years (IQR 37–62). During the study period, 41 (19.9%)

All prolactinomas, the TSH-secreting pituitary adenoma and 92.3% of NFPA were hyperintense while 80% of GH-secreting PA were hypointense. 41.7% of ACTH-secreting PAs were hyperintense, 33.3% were hypointense and 25% were isointense. 30 patients had tumour regrowth post-operatively, after a median of 39.5 months (IQR 19–84). Univariate analysis revealed a statistically significant association between tumour regrowth and the different subtypes of PAs (*P*=0.02), the presence of chiasmal compression (*P*=<0.001), suprasellar extension (*P*=0.006), cavernous sinus invasion (*P*=0.001), and the presence of residual tumour post–operatively (*P*=<0.001). Cavernous sinus invasion remained an independent predictor of regrowth after logistic regression (*P*=0.006; OR 6.5 95% CI 1.7–24.2). MR T2 solid tumour intensity was statistically significantly associated with maximal tumour diameter (*P*-value <0.001) and tumour volume (*P*-value <0.001), with hyperintense tumours being the largest (median 26.9 mm; IQR 19.8–34.2), followed by isointense (median 14.3 mm; IQR 7.3–28.6) and hypointense tumours (median 11 mm; IQR 7.8–15.9). There was no statistically significant association between tumour regrowth and MR solid T2 intensity.

Conclusion: Our study shows that tumour size is strongly associated with baseline MR T2 intensity patterns. However, such patterns were not significantly associated with tumour regrowth occurrence, with other indices having a stronger association.

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