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A study of meningiomas in South Africa: investigating a correlation between clinical presentation, histopathology and genetic markers.

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OBJECTIVE: To determine whether there are certain genetic markers which correlate with particular clinical characteristics of meningiomas including multiplicity, recurrence and calvarial erosion. **METHODS:** Thirty-eight South African-born patients with meningiomas were recruited for this study. At surgery, blood and tumour specimens were obtained for histopathological, cytogenetic and molecular analysis. Loss of heterozygosity (LOH) on chromosomes 1p and 22q were investigated and the NF2 gene on 22q12.2 was screened for disease-causing mutations. **RESULTS:** The commonest tumour locations were convexity (25%) and parasagittal (21%). The histology results showed that 86.8% of the patients had Grade I tumours and the remainder had Grade II tumours. A pathogenic nonsense mutation, R341X in the NF2 gene was found in only one patient. LOH on each of chromosomes 1p and 22q was observed in 44.7% of patients, but in different individuals. Significant associations were found between having specific tumour characteristics and both male gender (p-value = 0.0059) and 22q LOH (p-value = 0.0425). We estimated that having 22q LOH makes an individual approximately four times more likely to develop a tumour that exhibits multiplicity, recurrence or calvarial erosion (OR = 4.8; 95% CI: 1.2-23.4). Adjusting for gender strengthened this effect (OR = 6.1; 95% CI: 1.1-48.7). **CONCLUSIONS:** Our data indicate that male patients and patients with a meningioma that has 22q LOH are more likely to develop tumours exhibiting multiplicity, recurrence or calvarial erosion. We recommend that this subset of patients should be followed up more closely. Further study is needed to determine the benefit of adjuvant radiation therapy in this scenario.

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