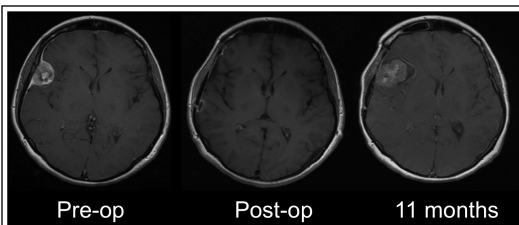


## Factors Associated with Early Aggressive Behaviour of Atypical Meningioma

Karol P Budohoski MD; Christopher Millward; James Clerking; Philip O'Halloran; Seamus Looby; Kieren Allinson; Thomas Santarius MD, PhD, FRCS; Mohsen Javadpour; Michael D. Jenkinson MD, FRCS; Ramez W. Kirollos FRCS
   
 Department of Neurosurgery, University of Cambridge, Cambridge; Department of Neurosurgery, The Walton Centre, Liverpool; Department of Neurosurgery, Beaumont Hospital, Dublin



### Results

**Table 1** Baseline characteristics

Factor		N (%)
Total number		221
Median age		61
Female sex		106 (48%)
Location	Convexity	105
	Parafalcine	35
	Skull base	48
	Other	33
Residual		62 (28%)
Adjuvant XRT	Residual	20 (9%)
	No residual	38 (17%)
Progression	Overall	71(32%)
	<1 year	21 (30%)
	<2 years	42 (59%)
	>2 years	29 (41%)

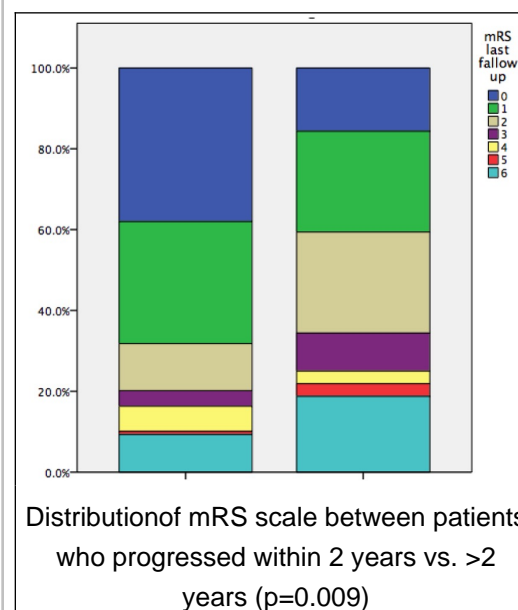
**Table 2** Independent predictors (imaging)

Factor		Recurrence (p=)	<1 year (p=)	<2 years (p=)
Location	Convexity	0.60	0.20	0.122
	Parafalcine	<b>0.007</b>	0.09	<b>0.009</b>
	Skull base	0.39	1	0.68
Oedema		0.29	0.08	<b>0.033</b>
Irregular margins		0.28	0.66	0.08
Bone erosion		1	0.60	0.65
Residual		<b>0.002</b>	0.21	<b>0.029</b>
XRT		0.25	0.44	0.85

**Table 3** Independent predictors (pathology)

Factor	Recurrence (p=)	<1 year (p=)	<2 years (p=)
Atypia	0.78	0.73	<b>0.04</b>
Brain invasion	0.28	0.36	0.41
Necrosis	0.81	0.49	0.60
MI	0.34	0.87	0.52
MIB1	0.09	0.52	0.95

**Figure 1**



### Conclusions

Atypical meningioma exhibit heterogeneous behaviour patterns.

- Independent factors associated with early aggressive behaviour include:
- parafalcine location
- edema
- atypia on histology
- subtotal resection.

Early recurrence of atypical meningioma was significantly associated with mRS at last follow-up. More work should be done to identify the cohort of patients at risk of early recurrence within the group of atypical meningioma.

### Learning Objectives

Atypical meningioma constitute a heterogeneous group of patients with different clinical courses.

Factors related to early recurrence as well as recurrence in general are identified and discussed.

### Introduction

Atypical meningiomas (WHO grade II) are known to recur in up to 30% of cases. While the mean time to progression is 24 months a number of tumour progress early.

We aim to investigate the imaging and pathological factors that predict early aggressive behaviour of atypical meningioma and its relation to outcome.

### Methods

Triple centre, retrospective study. We included all adults with WHO grade II meningioma (2007 WHO classification) diagnosed between 2007 and 2012.

### MRI characteristics:

- Tumour location
- Oedema
- Margins regularity
- Bone erosion
- Residual on post op MRI

### Pathology characteristics:

- Nuclear atypia
- Mitotic index (MI)
- Brain invasion
- Necrosis
- MIB-1