

## *Case report*

# **Metastases of malignant neoplasms to intracranial tumours: the “tumour-in-a-tumour” phenomenon \***

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**Summary.** This is a report of two observations of the metastatic spread of carcinomas to meningiomas. A survey of the relevant literature is given.

**Key words:** Malignant extracranial tumours – Metastatic spread to intracranial tumours – Carcinoma – Meningioma

Extracranial malignant tumours very infrequently metastasize into intracranial neoplasms, mostly into meningiomas (Anlyan et al. 1970; Bellur et al. 1979; Best 1963; Bernstein 1933; Buge et al. 1966; Chambers et al. 1980; DiBonito and Bianchi 1979; Döring et al. 1975; Fényes and Kepes 1956; Fried 1930; Györi 1976; Hirano 1981; Hockley 1975; Hope and Symon 1978; Kepes 1982; Lapresle et al. 1952; Olivecrona 1957; Osterberg 1957; Peison and Feigin 1961; Rubinstein 1972; Theologides 1972; Weems and Garcia 1977; Wilson et al. 1967; Wolintz and Mastro 1970; Wu 1977; Zoos 1970).

Even less frequently they have been found in acoustic neurinomas (Chambers et al. 1980; LeBlanc 1974; Rubinstein 1972; Wallach and Edberg 1959; Wong and Bennington 1962), gliomas (Farnsworth 1972; Posnikoff and Stratford 1960; Russell and Rubinstein 1977), and pituitary adenomas (Richardson and Katayama 1971).

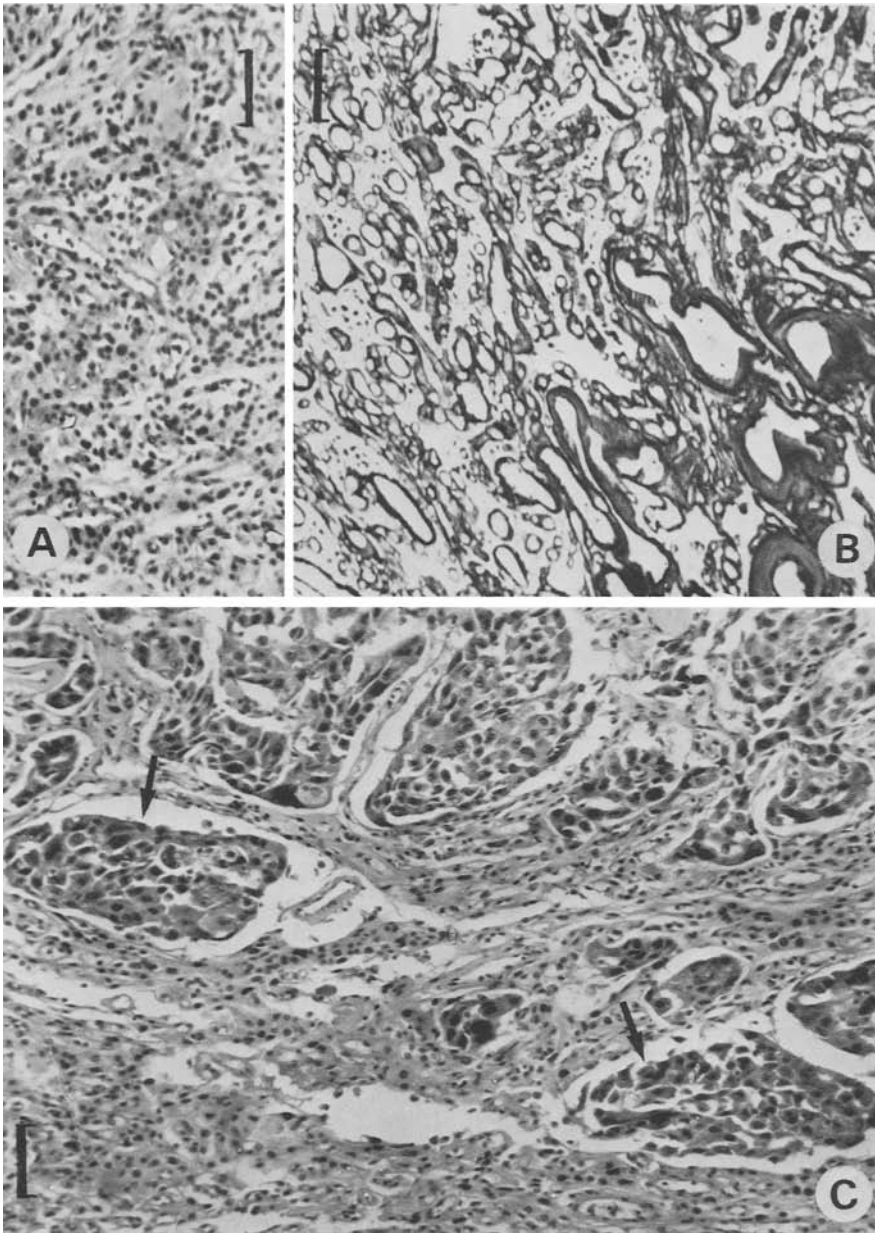
In very rare instances, the metastasis within a meningioma may represent the first clinical manifestation of the occult primary neoplasm.

## **Observations**

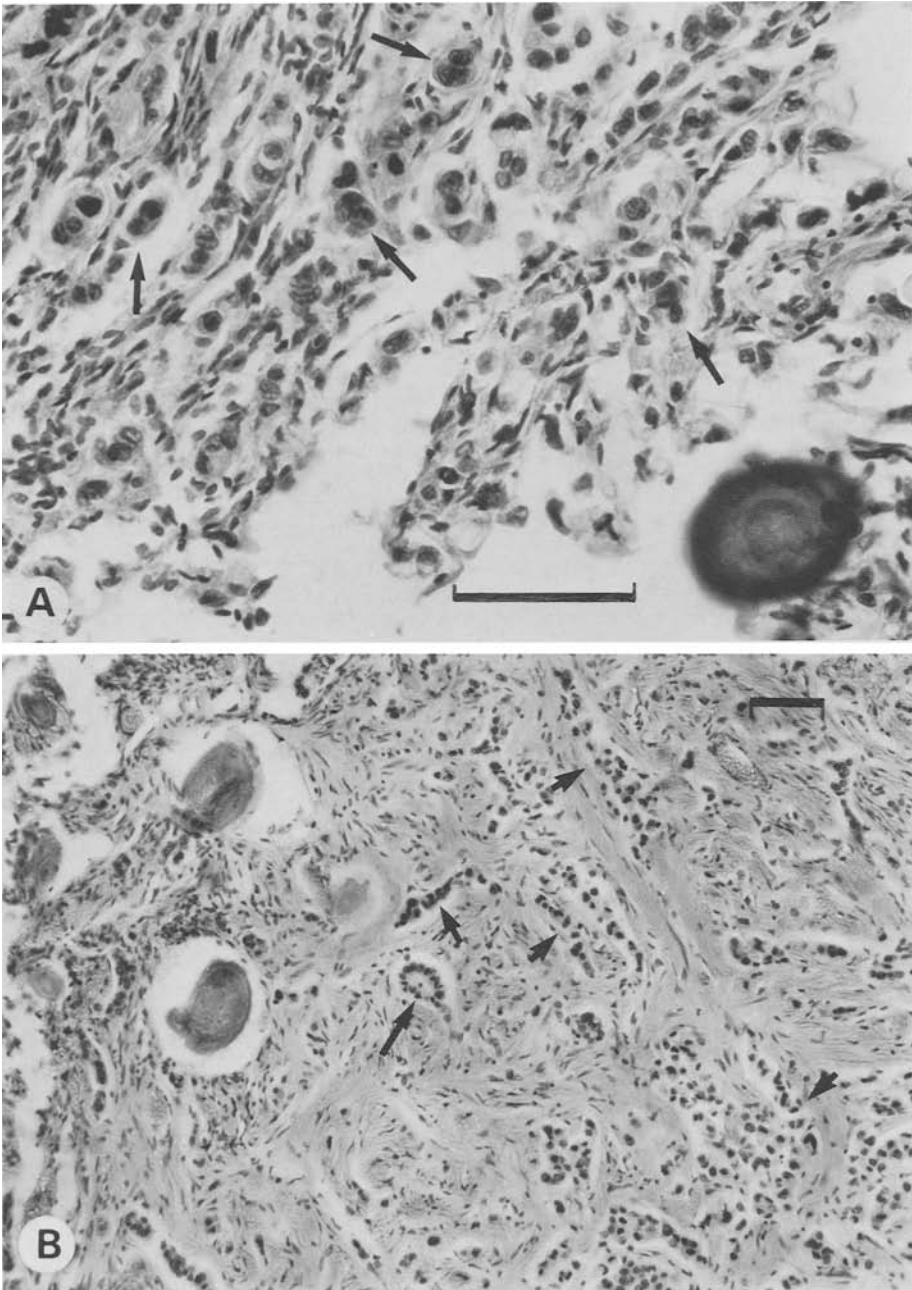
1. A 60 year old male had suffered from episodic headache and occasional grand-mal seizures since 1975. A left frontoparietal parasagittal meningioma, histologically haemangioblastic was

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\* Dedicated to Prof. Dr. Drs. h.c. Wilhelm Doerr, Director emeritus of the Institute of Pathology of the University of Heidelberg, FRG, on the occasion of his 70th anniversary



**Fig. 1 A–C.** Haemangioblastic meningioma (**A**, **B**) harboring collections of carcinoma cells (arrows in **C**). **C** Borderline region between the meningioma and the solitary metastasis of a bronchogenic carcinoma (H. & E. stain in **A**, **C**, Gomori's stain for reticulin in **B**; calibration bars represent 100  $\mu$ m) (Biopsy-No. 18830/78)



**Fig. 2A, B.** Metastasis of a mammary carcinoma in a psammomatous meningioma. **A** Scattered nests of carcinoma cells (*arrows*) and a psammoma body in the lower right corner. **B** Scirrhous part of the metastasis with strains of carcinoma cells arranged in single file formations (*short arrows*), and formation of a ductulus (*long arrow*). (H. & E. stain; calibration bars represent 100  $\mu$ m) (Autopsy-No. 1019/81)

**Table 1.** Literature observations of metastases to intracranial neoplasms

1. <i>to meningiomas:</i>			<i>N</i> = 33
– carcinomas of	bronchus/lung	10	
	mammary	9	
	kidneys	4	
	prostate gland	2	
	other organs	7	
– malignant lymphoma of	testis	1	
2. <i>to acoustic neurinomas:</i>			<i>N</i> = 5
– carcinomas of	bronchus/lung	4	
	mammary	1	
3. <i>to gliomas (oligodendroglioma, glioblastoma, ependymoma) and pituitary adenoma:</i>			<i>N</i> = 4
– carcinomas		3	
– melanoma (?)		1	

operated on in 1978. It was shown to harbor a metastatic focus of a poorly differentiated carcinoma (Fig. 1A–C) Since a primary neoplasm was not found, the patient was discharged. Two months later he was readmitted in very poor condition presenting hepatosplenomegaly and ascites due to a peritoneal carcinomatosis. He expired shortly after admission. General autopsy revealed a peripheral bronchus carcinoma with extensive metastatic spread. However, in the brain there was only a local recurrence at the site of the previous operation.

2. In a 68 year old woman a mammary carcinoma had metastasized into a right parietotemporal psammomatous meningioma (Fig. 2A and B) five years after the operation of the primary tumour. Here the metastasis to the meningioma was only part of a wide metastatic spread to all organs including the brain.

## Comments

A survey of the observations on metastatic spread of malignant neoplasms to intracranial tumours recorded in the literature is given in Table 1. Meningiomas are the most frequent host tumors with 33 out of 42 observations. Despite its rare occurrence the metastatic spread to intracranial tumours is not quite surprising and probably not merely coincidental since the host tumours usually belong to richly vascularized types. Intense vascularization probably provides an increased chance for circulating cancer cells to be “caught” and form metastases.

This view is in good agreement with the findings of Ortega et al. (1951), who reviewed 52 cases of extracranial tumours harboring metastases of carcinomas. Here, also the host tumours were predominantly types with a rich blood supply. In view of the increased coincidence of meningiomas with malignant extracranial tumours as suggested by findings of Bellur et al. (1979) meningiomas should in general be regarded as potential candidates for this special type of “collision tumour” in terms of Foulds (1940), and carefully examined for additional cancer cells, particularly in advanced age, where they may provide the first indication of an extracranial malignant neoplasm.

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