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Pituitary Adenoma and Meningioma in the Same Patient

Report of Three Cases

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Summary. Three patients are presented in whom both pituitary adenoma and meningioma were found. The pituitary tumour was a prolactinoma in one case and non-secreting adenoma in the other two. In one case the meningioma originated from the planum sphenoidale and was seperate from the pituitary adenoma. Another patient had a parasellar meningioma, which was suspected preoperatively by different enhancement on the CT scan. In the third case, both tumours were mainly infradiaphragmatic and could not be differentiated preoperatively or intraoperatively. This appears to be the first case with both tumours below the diaphragm. The clinical, radiological and histopathological findings are presented.

Key words: Pituitary adenoma – Meningioma – Computed tomography

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Introduction

The occurrence of multiple tumours of different histological types is rare [3]. Neurinomas (in von Recklinghausen's disease) and gliomas are sometimes observed in association with meningiomas [6, 14]. To date, only ten cases of pituitary adenoma in association with meningioma have been reported in the literature ([1, 2, 4, 5, 7, 8, 10, 11, 17, 18]; Table 1). Six of these

Table 1. Incidence of pituitary adenoma and meningioma in the same patient

Reference/year	Age/Sex	Pituitary adenoma type	Menigioma	
			Type	Site
Love and Blackburn [8], 1955	65/F	Non-secreting	Endotheliomatous	Sylvian fissure
O'Connell [10], 1961	47/F	Non-secreting	Endotheliomatous	Tuberculum sellae
Kitamura et al. [7], 1965	66/F	Non-secreting	Endotheliomatous	Sphenoid wing
Probst [11], 1971	48/F	Basophilic	Endotheliomatous	Suprasellar
Wild and Ruf [17], 1974	–	Non-secreting	–	Suprasellar
Brennan [1], 1977	36/M	Non-secreting	Transitional	Sphenoid wing
Bunick et al. [2], 1978	57/F	Eosinophilic	Fibroplastic	Planum sphenoidale
Hainer et al. [4], 1978	72/M	Eosinophilic	–	Suprasellar
Hyodo et al. [5], 1982	52/F	Eosinophilic	Fibroplatic	Convexity
Yamada et al. [18], 1985	52/F	Non-secreting	Endotheliomatous	Sphenoid wing
Case 1 (Freiburg), 1987	46/M	Prolactinoma	Transitional	Planum sphenoidale
Case 2 (Freiburg), 1986	63/F	Non-secreting	Endotheliomatous	Sphenoid wing
Case 3 (Freiburg), 1986	61/F	Non-secreting	Endotheliomatous	Infradiaphragmatic

were secreting adenomas [1, 7, 8, 10, 17, 18]. The majority of meningiomas were classified as endotheliomatous, less often as fibroblastic. In our three additional cases there were different topographical relationships between the tumours. The one patient with an infradiaphragmatic meningioma and adenoma (which could not be differentiated by CT) is to our knowledge the first reported case of this type.

Case Reports

Case 1. This 46-year-old patient was admitted after CT demonstration of a large intrasellar and suprasellar space-occupying lesion with intratumoral bleeding and obstructive hydrocephalus. Neurological examination revealed an incomplete right oculomotor paresis and complete paresis of the right arm due to a lesion of the brachial plexus. The patient was somnolent. After an emergency shunting procedure, he regained consciousness and further neurological examination revealed loss of visual acuity on the right side and an incomplete temporal deficit in the right visual field. Endocrinological investigation showed an increase of the prolactin level to 100 ng/ml. After 4 weeks of treatment with bromocriptine, repeated CT showed a marked volume reduction of the suprasellar tumour. In addition, a hyperdense tumour 1.5 cm in diameter without connection to the pituitary adenoma was identified in the region of the planum sphenoidale (Fig. 1). The second tumour was assumed to be a meningioma. Both tumours were removed via a left-sided pterional approach. Histologically, the intrasellar and suprasellar tumour was shown to be a prolactinoma, and the second tumour a meningioma of transitional type (Fig. 2). The postoperatively course was uneventful.

Case 2. This 63-year-old patient was admitted after a 2-month history of ataxia and CT demonstration of a large intrasellar, suprasellar and right parasellar space-occupying lesion. The enhanced CT scan showed an increased density of the parasellar tumour (Fig. 3). Neurological examination revealed an incomplete bitemporal hemianopsia without loss of visual acuity and a moderate gait and stand ataxia. In addition to an elevation of the A1 portion of the right anterior cerebral artery, angiography showed a blush of the parasellar tumour, supplied by the ophthalmic artery. Prolactin, SHT and ACTH levels were normal. The pituitary adenoma was removed via a transnasal-transsphenoidal approach. Histological diagnosis confirmed a hormone-inactive adenoma. With the exception of temporary diabetes insipidus, the postoperative course was uneventful. One month later the parasellar tumour was removed via a pterional approach. A meningioma with a broad base on the sphenoid wing was found. The diaphragma sellae was intact. The meningioma was shown histologically to be endotheliomatous. The postoperative course after the second operation was also uneventful.

Case 3. This 61-year-old patient was admitted after a 6-month history of frontal headaches and CT demonstration of a large intrasellar and suprasellar space-occupying hyperdense lesion with an enlarged sella (Fig. 4). Neurological examination showed a moderate loss of visual acuity on both sides, as well as a reduction of the temporal visual fields and a partial right-sided optic atrophy. Angiography revealed elevation of A1 portions of both anterior cerebral arteries without tumour enhancement.

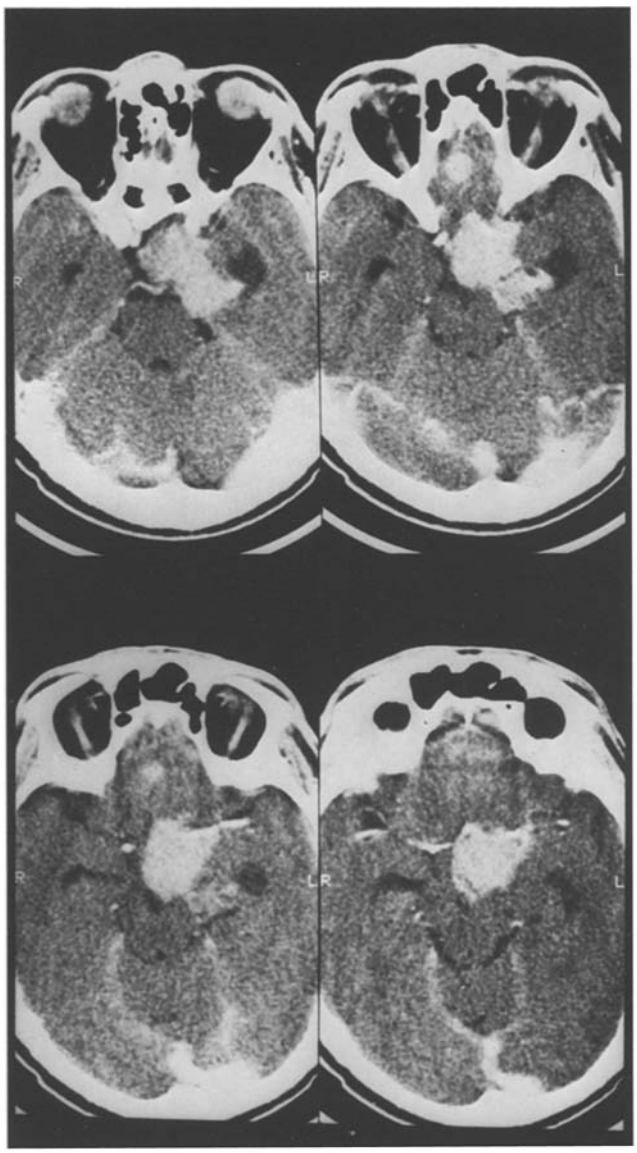

Fig. 1. Large intrasellar and left-sided suprasellar pituitary adenoma. Small meningioma of the planum sphenoidale without connection to the pituitary adenoma

Endocrinological investigation showed an increased prolactin level, while STH and ACTH were normal. The infradiaphragmatic tumour was removed via a transnasal-transsphenoidal approach. Besides the typical soft and fragile tissue of an adenoma, a more dense tumour tissue was found. Histological study showed this to be a typical hormone-inactive pituitary adenoma and an endotheliomatous meningioma. The immediate postoperative course was uneventful until the evening after surgery, when a progressive bilateral visual loss and a right-sided oculomotor paresis developed. Reoperation via the original transnasal-transsphenoidal approach revealed bleeding in the tumour bed with negligible infradiaphragmatic residual tumour. After a brief recovery, the patient deteriorated again on the 1st postoperative day. Reoperation performed via a pterional approach showed large clots in the optic cisterns and a small supradiaphragmatic residual tumour. Histological inves-

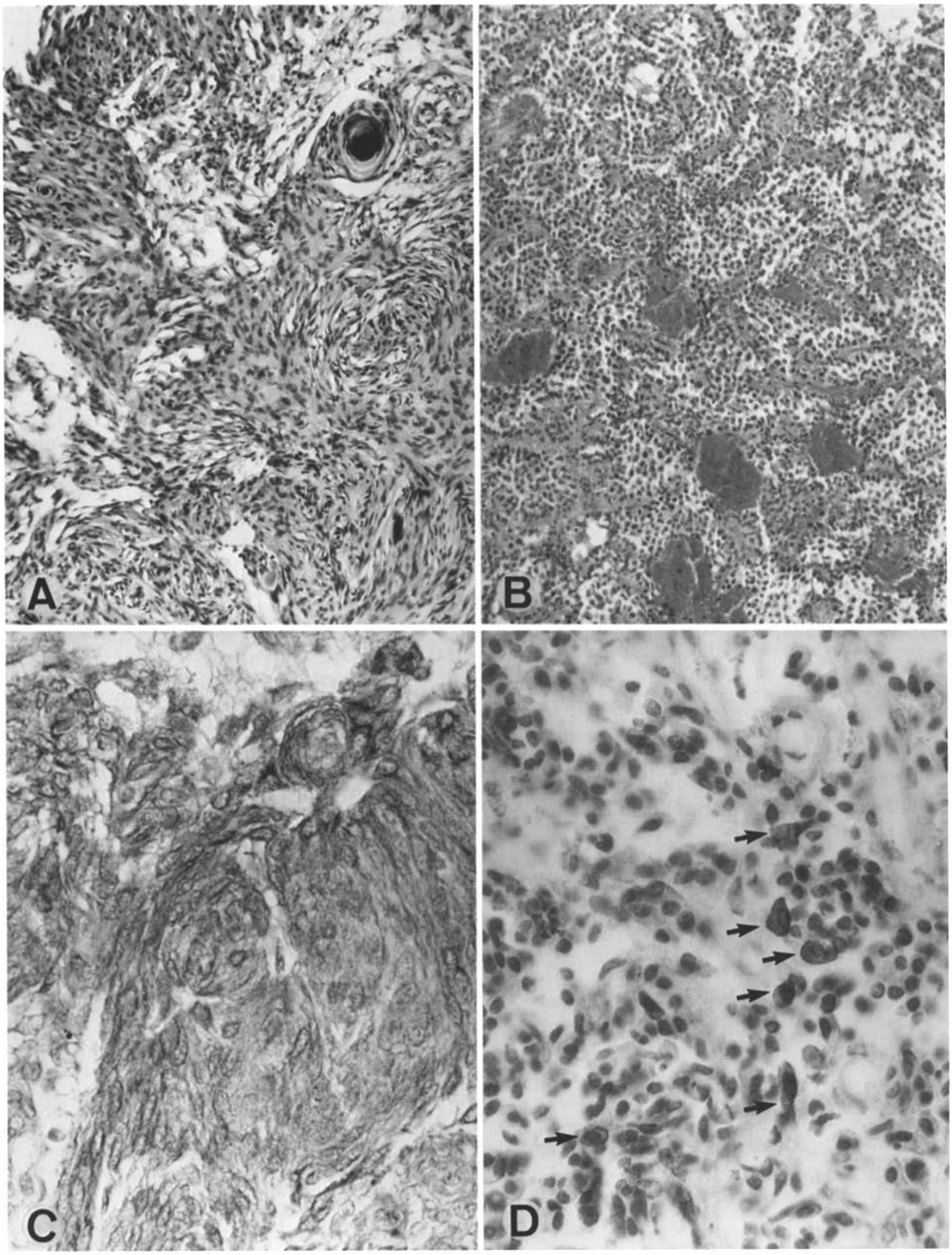

Fig. 2. Meningioma of the planum sphenoidale (**A, C**) and prolactin-secreting pituitary adenoma (**B, D**) of case 1. Light microscopy shows the characteristic pattern of a transitional meningioma (**A**) with whorl formation and an occasional psammoma body and a sinusoidal-type pituitary adenoma (**B**) with multiple haemorrhages. Expression of the intermediate filament protein vimentin (**C**) is present in most meningioma cells, but accentuated in the perinuclear cell body. In contrast, prolactin immunoreactivity (**D**) is restricted to single neoplastic cells *(arrows)*

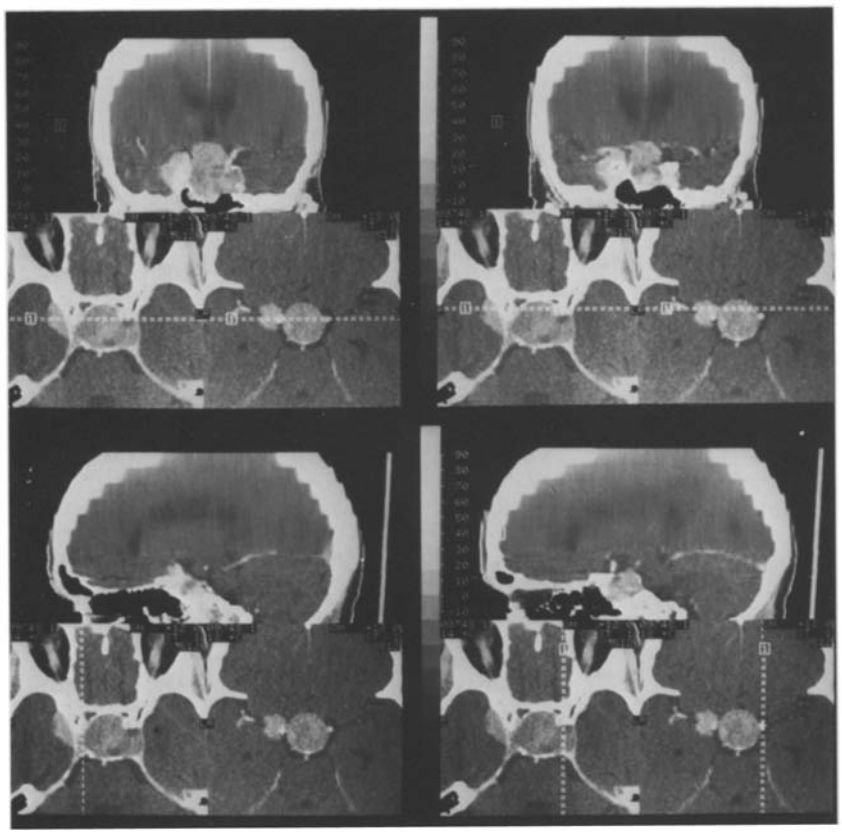

Fig. 3. Pituitary adenoma with intrasellar and suprasellar extension and an enlarged sella. The right-sided parasellar meningioma can be differentiated on CT scan by localization and different contrast medium enhancement

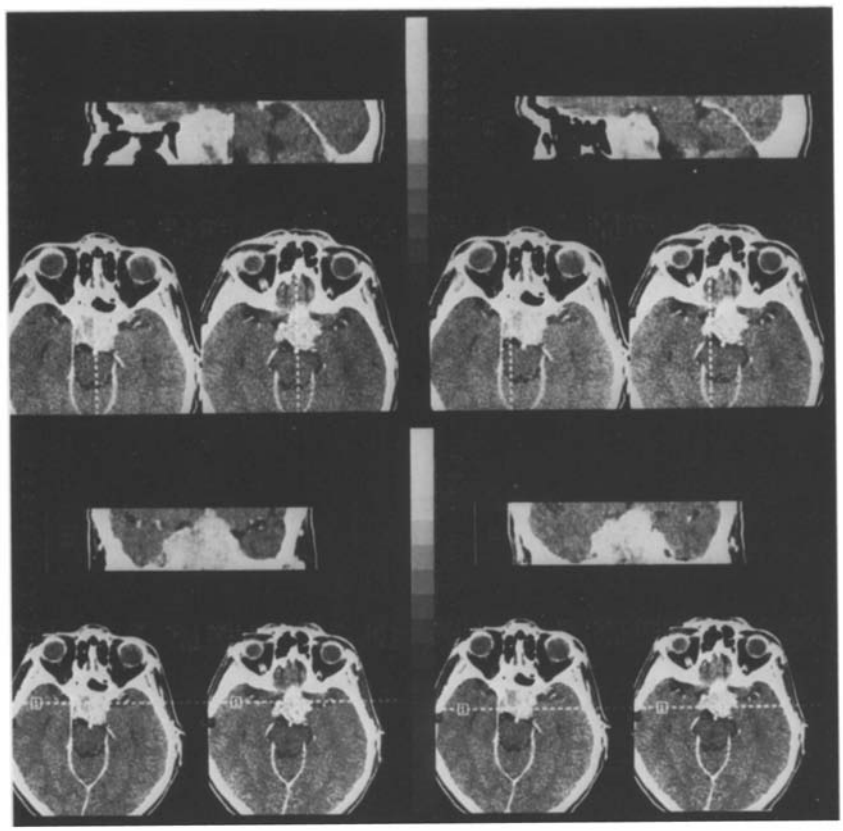

Fig. 4. Large intrasellar, suprasellar and parasellar tumour with an enlarged sella. The histologically proven pituitary adenoma and meningioma cannot be differentiated by CT scan

tigation of the supradiaphragmatic tumour revealed a typical pituitary adenoma. The further postoperative course was uneventful with a slight recovery of vision and of the oculomotor paresis.

Discussion

The development of meningiomas after radiation therapy, severe head injury and inflammatory diseases is well known [9, 12–16]. Such aetiology could be ruled out in our patients. The cases showed different topographical relationsships between the tumours: without connection, with close connection and with simultaneous occurrence of both tumours below the diaphragm. Computed tomography revealed the presence of a second tumour in the first case, while the meningioma could only be suspected in the second case by localization and different contrast medium enhancement. In this case, angiography with enhancement of the second tumour was helpful. Yamada et al. [18] presented a similar case. The third case was exceptional because of the infradiaphragmatic situation of both tumours. In this case, differentiation of the tumours was not possible by CT, and even the surgeon did not suspect two different tumours intraoperatively. To the best of our knowledge, this is the first published case with infradiaphragmatic occurrence of a meningioma and a pituitary adenoma.

In retrospect, the transnasal-transsphenoidal approach, which was chosen as a primary procedure in the second and third cases, was the correct strategy, despite the bleeding complications in the third case. It was possible to remove the infradiaphragmatic tumours via the transnasal approach. A primary transcranial approach can be considered if a supradiaphragmatic or parasellar tumour is suspected. However, the removal of an intrasellar tumour may be difficult by a transcranial approach, especially with a prefixed chiasma, as was encountered during surgery in the case of the second patient.

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