

SECRETORY MENINGIOMA A CONVENTIONAL HISTOCHEMICAL STUDY OF SIX CASES

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SUMMARY :

Six meningiomas with abundant hyaline inclusions (pseudopsammoma bodies) were studied in means of a panel of conventional histochemistry. In all six cases, the inclusions were PAS-positive, diastase resistant and stained picrophilic (yellow-bright orange) with van Gieson. Negative staining was obtained by von Kossa, Congo red and Gomori's reticulin. A remarkable pericytic proliferation around the vessel wall was found in five cases. It is concluded that secretory meningioma is a distinct type of meningioma. It shows characteristic light-microscopic, ultrastructural, and immunohistochemical features of epithelial and secretory differentiation.

KEY WORDS

Meningioma, Secretory meningioma, Hyaline inclusion, Histochemistry.

INTRODUCTION

Meningiomas show a wide range of histologic of patterns by which they may be classified (3,7,9). They originate from pluripotent arachnoidal cap cells which may differentiate along various cell lines and show epithelioid differentiation (1,7).

Hyaline inclusions in meningiomas were first noticed by Cushing and Eisenhardt (1,2,4). The term "pseudopsammoma bodies" was first used by Kepes (1,2,4,5,7). Ultrastructurally, they are characterized by granular proteinaceous material located in intra-or extracytoplasmic lumina lined by microvilli (1,2,4,5,7,8). Immunohistochemically, they have positive reactivity for the secretory component (SC), IgA and IgM, alpha-1-anti-trypsin (AAT) and carcinoembryonic antigen (CEA) (1,3,7,8). Secretory meningiomas are rare and account for only between 1.2 % and 9.3 % of all meningiomas (1,8).

In this study of six meningiomas with pseudopsammoma bodies we describe the histochemical features which are distinct from psammoma bodies.

MATERIALS AND METHODS

Six meningiomas with hyaline inclusions were found on reviewing 69 meningiomas diagnosed at the Pathology Department of Marmara Medical School a period of 5 years (1986-1990). This accounts for 8.7 % of all meningiomas in our department. The cases were studied by conventional light microscopy, including hematoxylin-eosin (HE), periodic acid-Schiff (PAS) with and without diastase digestion, van Gieson, Congo red, Gomori's reticulin and von Kossa stains. The same histochemistry and electron microscopy were used on the available material.

The most relevant clinical findings of the seven cases were also reviewed (Table-1).

Table : 1 Clinical data of cases
n = 6

Case	Age/Sex	Duration Symptom	Tumour Location	Diameter (cm.)	Follow-Up
1	48/F	(*)	Frontal	1.5	Alive & Healthy
2	59/F	18 mo.	Tentorium	1	" "
3	60/F	(*)	F. Magnum	3	" "
4	60/F	6 mo.	Tentorium	1.5	Died
5	49/F	6 mo.	Infratentorial	2	Recurrence
6	51/F	10 days	Sphenoidal Ridge	2	Alive & Healthy

(*) No data available.

RESULTS

Clinical findings

All six patients were women between 48 and 60 years of age, with a mean of 54.5 years. The tumours were all intracranial, ranging in diameter from 1 to 3 cm (Table-1).

On follow-up, six patients were well and free of disease at 1, 12, 15, and 25 months after surgery, one patient died within a week after operation due to respiratory arrest. The last patient who is well have a residual tumour 5 months after surgery, but was free of disease 12 months after the second operation.

Conventional Histochemistry

Five tumours showed a typical meningothelial pattern, whereas the other was of the transitional

type (Table-2). All six tumours were histologically benign. They contained abundant rounded hyaline inclusions in both the cytoplasm of scattered tumour cells and in small lumina lined by flattened tumour cells (Fig. 1,2). The inclusions varied in size, generally homogeneous and brightly eosinophilic with HE stain. They were all PAS positive, diastase resistant, stained picophilic (yellow) with van Gieson. None stained with von Kossa or Gomori's reticulin. The three cases of psammomatous meningioma were also PAS positive, diastase resistant and stained fuchsinophilic (bright red) with van Gieson. The psammoma bodies also stained positive with von Kossa and Gomori's reticulin. Both psammoma and pseudopsammoma bodies did not give birefringence by Congo red under polarized microscopy (Table-3).

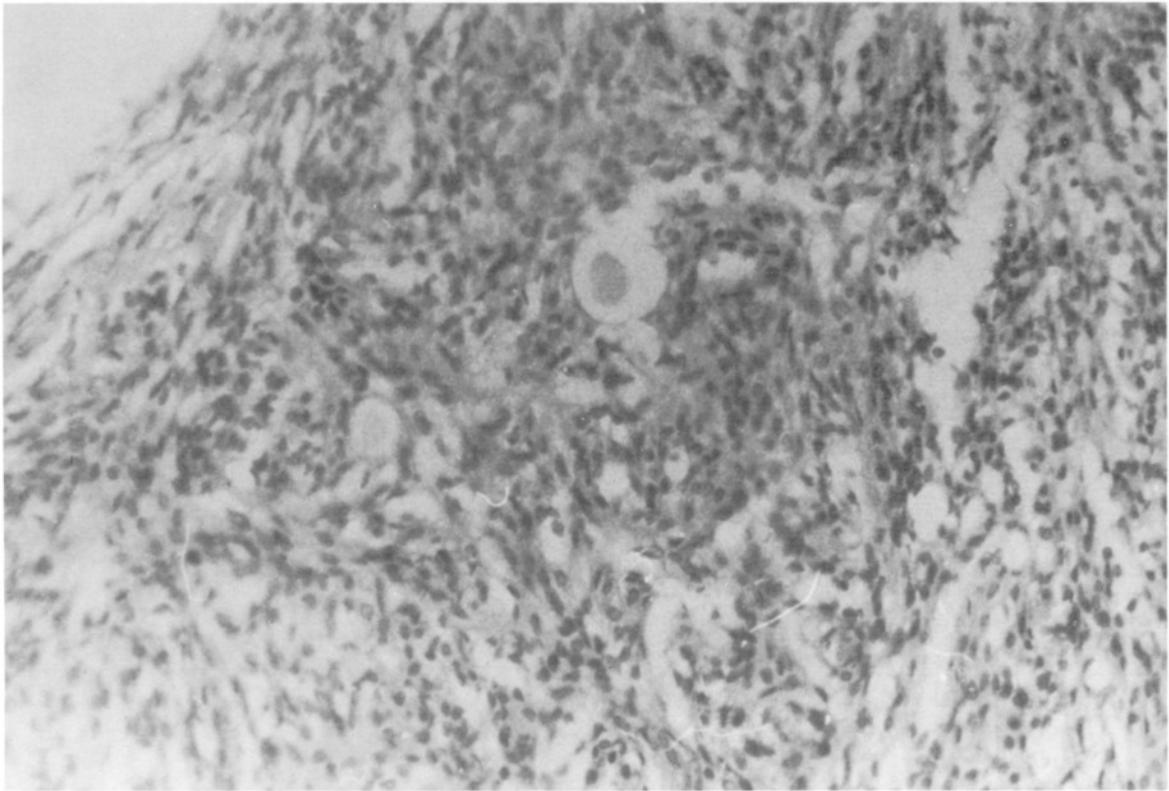


Fig 1 : Meningotheliomatous meningioma with hyaline inclusions and pericytic proliferation around the vessel walls. (H.E., Original magnification x200).

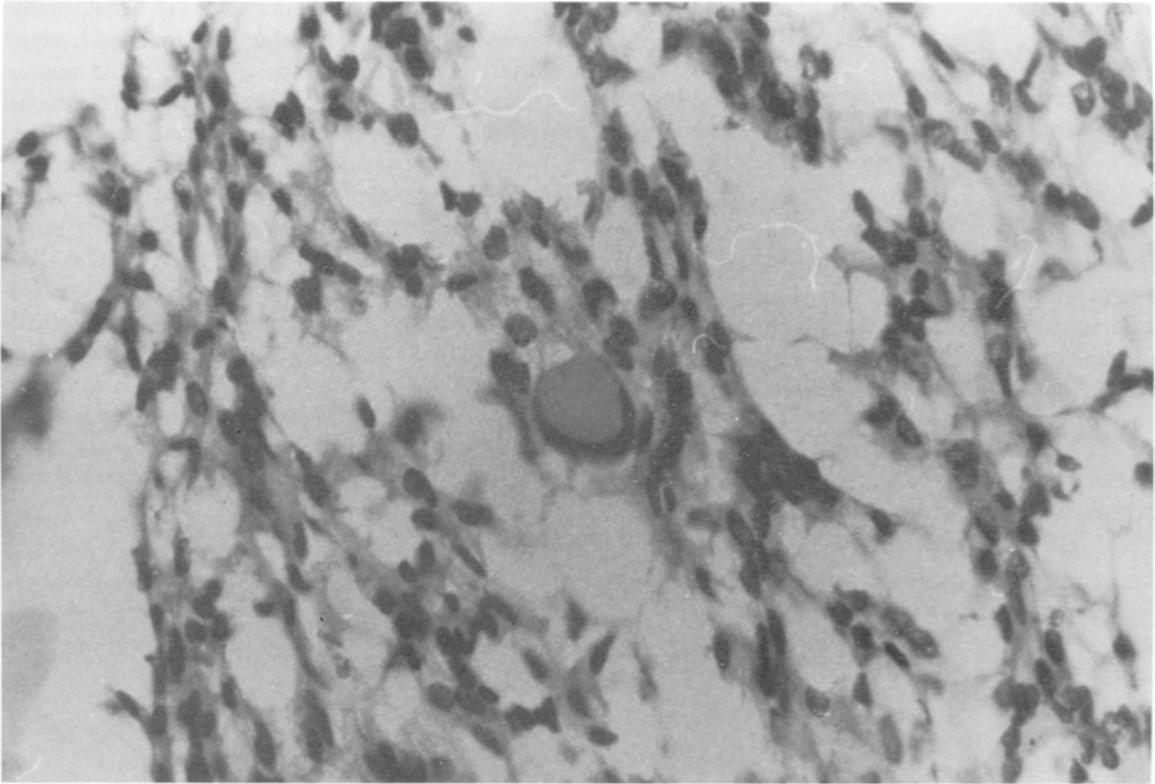


Fig 2 : A typical intracytoplasmic hyaline inclusion ("pseudopsammoma bodies"). (H.E., Original magnification x400).

In five cases a remarkable proliferation and crowding of small dark pericytic cells around the vessel walls was noted.

Psammoma bodies were either rare (one case) or absent (five cases) in tumours containing hyaline inclusions (Table-2).

Table 2 : Light Microscopic Features of the cases

Case	Histological Type	Pericytic Proliferation	Psammoma Bodies
1	Meningothelial	+	+
2	Meningothelial	+	-
3	Meningothelial	+	-
4	Meningothelial	-	-
5(*)	Meningothelial	+	-
6	Meningothelial	+	-

(*) Recurrent meningioma

Table 3 : "Pseudopsammoma bodies" compared with psammoma bodies (light microscopy)

Stain	Psammoma bodies	Pseudopsammoma bodies
H.E.	Eosinophilic	Eosinophilic
van Gieson	Bright red	Yellow-bright orange
PAS reaction	Positive	Positive
PAS+Diastase	Positive	Positive
Reticulin	Positive	Negative
Congo red	Negative	Negative
von Kossa	Positive	Negative

DISCUSSION

The hyaline inclusions described in this study are distinct from psammoma bodies, both by light microscopy (Table-3) and ultrastructurally (5). Ultrastructurally, it was demonstrated that the pseudopsammoma bodies consisted of lumina both intra- and extracellular which was lined by microvilli (1,2,4,5,7,8). Also the presence of features like accumulated secretory material, tonofilaments, and desmosomes were indications of epithelial and secretory differentiation (1,2,4,7,8).

Immunohistochemically, both tumour cells and inclusions gave positive reactivity with CEA and epithelial membrane antigen (EMA). Frequently, they were positive with cytokeratin, secretory component (IgA and IgM), and AAT, which support an epithelial and secretory differentiation (1,7,8). Both the inclusions and the tumour cells gave negative reactivity for S-100, SNE, GFAP, IgG, Factor VIII-related antigen, HCG, alpha-fetoprotein, placental lactogen, alpha-lactalbumin, and lysozyme (1,7,8).

There is no specific clinical feature associated with this type of meningioma, except unusual severe cerebral oedema and sudden clinical presentation reported by some authors (1,6).

Histogenetically, meningiomas originate from pluripotent arachnoidal cap cells which may differentiate along various mesenchymal and epithelial cell lines like the mesothelium, synovium, Schwann cells and pericytes (1).

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