

Transsphenoidal Therapeutic Puncture of a Cystic Pituitary Adenoma

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ABSTRACT

Transsphenoidal diagnostic puncture of skull base tumours has been a routine procedure in Uppsala for a decade. Bromocriptine is the treatment of choice for patients with prolactin secreting pituitary adenomas. Here we report on a patient with a pituitary adenoma who instead developed an increase in tumour size after bromocriptine treatment. Magnetic resonance imaging showed the tumor to be cystic. A transsphenoidal puncture was used therapeutically instead of surgery with excellent result.

INTRODUCTION

Bromocriptine treatment of prolactin-secreting pituitary adenomas usually results in a decrease of tumour size (27 out of 27 patients) (8). Occasionally there is, however, an expansion of the tumour which may lead to progressive visual deterioration (3) and a demand for immediate surgery. The effect of the bromocriptine treatment is in most of the cases shrinkage of the tumour mass but sometimes a necrosis or cyst develops (2,5). Such cysts can be difficult to discover on computed tomography. Magnetic resonance imaging (MRI) on the other hand is an excellent method to diagnose necrotic and cystic changes in pituitary adenomas (5, 7).

Transsphenoidal diagnostic puncture of skull base tumors including pituitary adenomas has been a routine procedure at the University Hospital in Uppsala for more than 10 years (1, 8). In the present communication we describe that a transsphenoidal puncture also can be used as a therapeutic procedure.

CASE REPORT

A 38 year-old female patient, with two children born 1974 and 1977 had noticed galactorrhea since end of breast feeding 1978. Her menstrual periods were regular up to 1982.

Endocrine evaluation 1985 revealed hyperprolactinemia 42-69 $\mu\text{g/l}$ (normal < 20 $\mu\text{g/l}$) with no apparent diurnal variations. LH-RH and TRH-tests showed normal increase in serum LH and TSH. Serum oestradiol was below normal value for a woman of fertile age. No indication of thyroid or adrenal gland insufficiency was found.

CT and MRI disclosed an intra- and suprasellar expansion reaching the chiasm. The visual fields were, however, normal.

The patient was given 50 mg bromocriptine retard i.m. August 9, 1985, which led to a normalization of serum prolactin already 4 hours after the injection. Six weeks later treatment with bromocriptine 2.5 mg twice a day orally was initiated. Serum prolactin values remained normal.

September 1985 the patients vision deteriorated with development of partial bitemporal hemianopsia and in October 1985 further progression of the visual field defects was observed. CT showed an increase in tumour size a few millimeters in the suprasellar region.

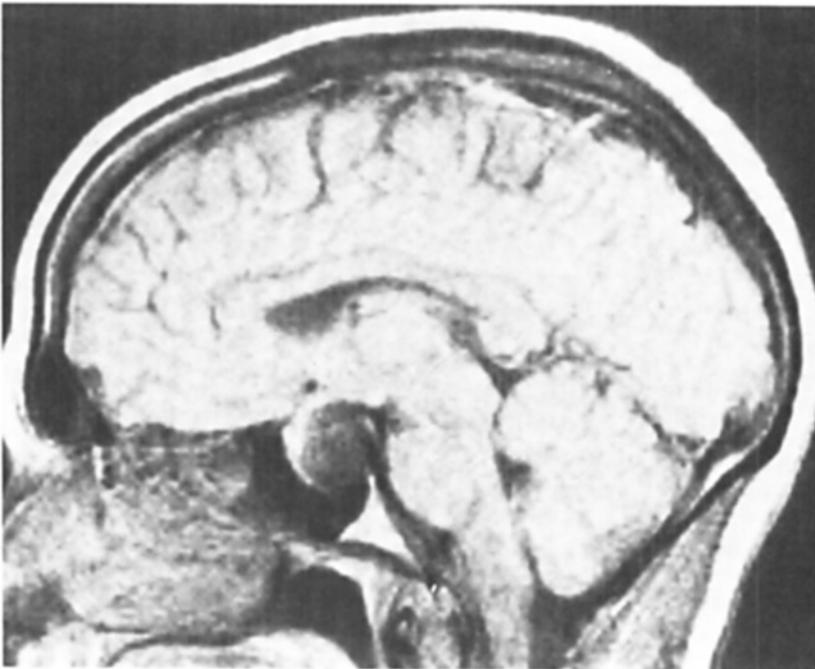
MRI with T1, T2 and proton density weighted images including a subtraction procedure now showed the tumour to be cystic with a thin cyst wall (Fig. 1 a and b).

October 29, 1985 a transnasal-transsphenoidal aspiration puncture of the cyst was performed. The position of the needle was during the puncture checked by fluoroscopy in the lateral projection. At 5 occasions with a few minutes interval a waterthin blood stained fluid, altogether 5 ml, was aspirated. At the 3 first occasions the patient experienced visual sensations in the form of differently coloured dots described to mimic pseudoisochromatic images. The patient also experienced a slight pain at both temples.

An ophthalmologic examination performed after the procedure now demonstrated normal visual fields. A repeated MRI the same afternoon revealed a considerable reduction in the tumour volume (Fig. 2). There was no longer any suprasellar portion of the tumor. The upper tumour surface was concave and the sella was partially empty. After the therapeutic puncture the patient was kept on



Fig. 1 Midsagittal MR image of the pituitary tumour with suprasellar extension
a) T1 weighted image;



b) subtraction image showing the cystic part of the tumour.

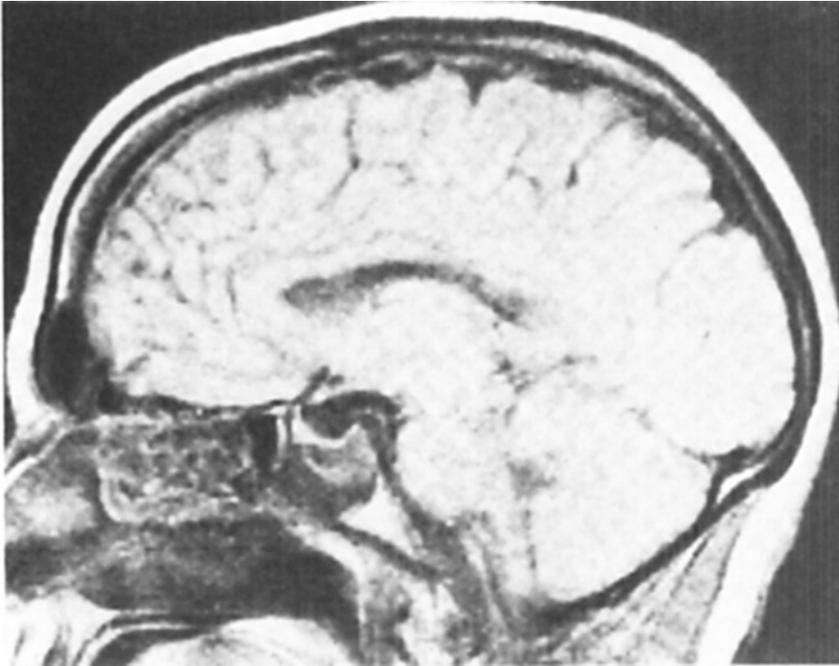


Fig. 2 Midsagittal MR image demonstrating the reduced size of the tumour immediately after the cyst puncture. Subtraction image.

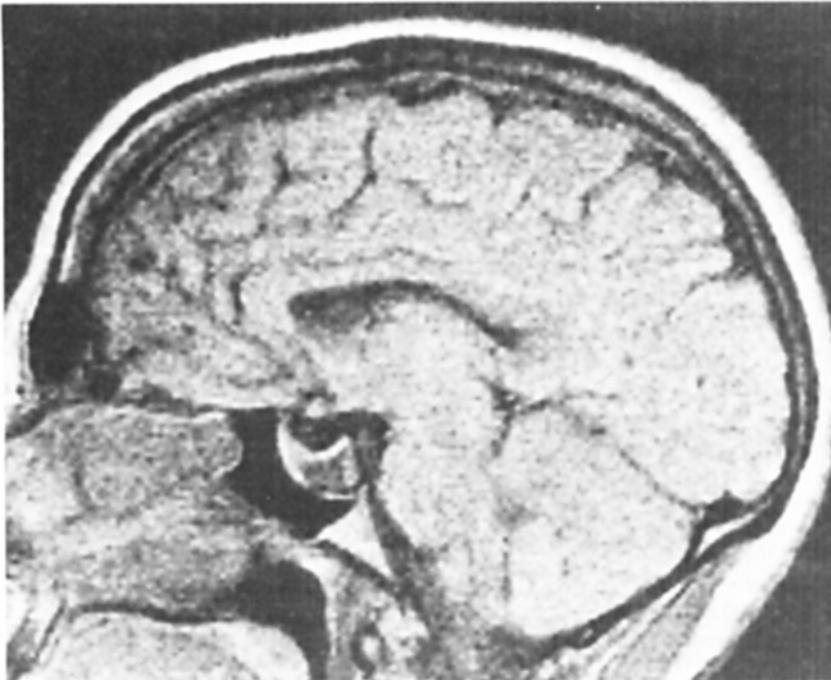


Fig. 3 At 10 months follow-up MRI showed the same tumour size as in Fig. 2.

bromocriptine treatment. Galactorrhea and amenorrhea disappeared. At follow-up 3 and 10 months after the puncture MRI showed a tumour appearance similar to that found immediately after the puncture (Fig. 3).

COMMENTS

Diagnostic puncture of skull base tumors, particularly pituitary adenomas, has been a routine procedure at our hospital. Until now more than 80 patients have been investigated. The puncture is performed with a fine needle biopsy instrument. The needle with a mandrin is 15 cm long with an outer diameter of 0.9 mm. The needle is entered through the nose cavity below the anterior part of the middle turbinate. The final position of the needle is checked by fluoroscopy in the lateral projection. When the skull base is completely invaded by the tumour the needle passes without any pressure. Otherwise the needle is rotated under gentle pressure until it is passed through the walls of sphenoid sinus into the tumour area. The needle is introduced about 1 cm into the tumour. At that time the position of the needle is checked by X-ray in the frontal and lateral projections. The fluid is aspirated after check of possible bleeding. Care is taken not to loose the needle from the syringe during the procedure to avoid air embolism.

So far few of the patients have experienced pain or other disagreeable sensations. There have been no serious complications. A slight bleeding after removal of the needle has on two occasions necessitated a tamponade for a few hours. A slight leakage of cerebrospinal fluid which stopped spontaneously occurred in two patients. Signs of meningitis have never been observed.

Cysts within pituitary tumours may be recognized on CT. However, according to our experience of MRI in more than 120 patients with tumours in the sellar region cysts or necrosis are better visualized with MRI than with CT (5, 7). We also apply a technique of subtraction of two MR images with the same repetition time but different echo delays which gives further information about the tissue components of the tumour than the standard images (4).

Treatment of prolactin secreting pituitary adenomas with oral bromocriptine is recognized to be very effective with few side-effects. Bromocriptine given in a slow release preparation i.m. results, however, in a more rapid decrease of serum prolactin. According to our experience in 20 patients it also gives fewer side-effects.

The effect of the injection lasts for 6 weeks and the treatment is thereafter continued with oral bromocriptine. We have observed in 5 further of our prolactinoma patients treated in such a way that magnetic resonance signal analysis revealed development of intratumor cysts (5).

Transsphenoidal therapeutic puncture of expanding cysts seems to be an alternative to open transsphenoidal surgery and very lenient to the patients.

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