Asymptomatic Spontaneous Rupture of Suprasellar Dermoid Cyst : A Case Report

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Summary

Suprasellar dermoid cysts are uncommon intracranial lesions. CT and MRI findings in a rare case of asymptomatic rupture of suprasellar dermoid cyst with subarachnoid dissemination is described.

Key words : Suprasellar, Dermoid, Asymptomatic, Rupture.

Introduction

Intracranial dermoid cysts are rare benign lesions and account for less than 1% of all intracranial lesions.1-3 Rupture of a dermoid cyst with spillage of its contents into subarachnoid space and/or ventricles is a potentially serious complication that can lead to meningitis, seizures, cerebral ischemia and hydrocephalus and rarely olfactory delusions.1-15 Rarely dermoid rupture without causing any symptoms or neurological signs and symptoms.16,17 We describe a case of asymptomatic spontaneous rupture of a suprasellar dermoid cyst diagnosed preoperatively by MRI.

Case Report

A 45 year old woman presented with gradual diminution of vision of two months duration, and occasional dull headache for the past 3 years which got relieved with analgesics. On examination, her higher mental functions were normal. Vision in the left eye was 6/36 and there was no perception of light in the right eye. Fundus examination showed evidence of bilateral optic atrophy. No sensorimotor deficits, signs of raised intracranial tension or meningeal irritation were found. Laboratory investigations were within normal limits. CT scan showed a large suprasellar hypodense mass with peripheral calcification in the suprasellar region, causing mass effect on the cerebral peduncles and widening the interpeduncular fossa. The lesion measured 30.7x33.9 mm in size. The mean attenuation of the mass was -25 Hounsfield units (HU) (range < -40 to 10 HU). No enhancement after intravenous contrast administration was seen.

MRI showed a T1 hyperintense, irregular mass with some heterogeneous signal intensities within (Fig. 1a). No enhancement with Gd-DTPA was seen.
Areas of hypointensity corresponding to calcification seen on CT were seen in the periphery of the mass. In addition there were hyperintense spots in the subarachnoid space and inter-hemispheric fissure, suggestive of spilled dermoid contents (Fig. 1b and c). A diagnosis of ruptured dermoid with subarachnoid dissemination of dermoid contents was made. She underwent right pterional craniotomy and excision of the tumor. At surgery, the tumor was found to be adherent to the right optic nerve and the optic chiasm with stretching and infiltration of the right optic nerve by the capsule of the dermoid. Hair and whitish material was sucked out of the cyst. Partial excision of the capsule was done. Histology of capsule revealed stratified squamous epithelium with fatty cellular debris, few hair follicles and scattered sebaceous glands consistent with the diagnosis of dermoid cyst. Post operative recovery was uneventful. Her left eye vision improved to 6/24. No new neurological deficits were found after 11 months of follow up after surgery.

Discussion

Dermoid cysts are thick walled cysts lined by keratinized squamous epithelium and supported by a well formed dermis containing skin appendages, usually hair and hair follicles, sebaceous and sweat glands, teeth or nails. The cyst material can have different consistency depending upon the ratio of the various elements within the wall.\textsuperscript{1,2} All the ectodermal contents may or may not be present in a single patient. Intracranial dermoid cysts are most commonly seen below the tentorium, usually in the midline, either in the cavity of the fourth ventricle or in the vermis. There is often an associated dermal sinus.\textsuperscript{3,4} Supratentorial dermoid cysts are less common and are usually located on the skull base near the midline. Suprasellar and pineal dermoids are rare sites.\textsuperscript{5} Cranial abnormalities such as bone defects, dermal
sinuses, or meningoencephaloceles are not associated
with supratentorial dermoid cyst.5 Posterior fossa
dermoid cysts commonly present in first decade,
whereas supratentorial dermoids appear in the 20-30
year age group, although the age of presentation is
variable.5

Intracranial dermoid cysts are generally benign and
slow growing. Enlargement of these cysts occur by
secretion of dermal elements. Symptoms are referable
to compression of adjacent neural structures resulting
in focal neurological dysfunction or obstruction of
cerebrospinal pathway.7 Mean duration of symptoms
before presentation of supratentorial dermoid cysts
varies from 3 months to 6.87 years.5,7 Majority of
cases had epilepsy. Suprasellar lesions reveal
themselves early with visual disturbances or headache
due to hydrocephalus.

The imaging characteristics of dermoid cysts depend
on the contents of the lesion. On CT these lesions are
demonstrated to be homogeneous with attenuation
similar to that of cerebrospinal fluid (CSF). On MRI,
hair and sebaceous contents of the cyst gives dermoid
an heterogeneous appearance and the fat content is
seen as hyperintensity on T1WI.5,6 The fat content of
the dermoid cyst varies widely. Demonstration of fat
in a cystic lesion is considered diagnostic of dermoids.
When the fat content is low dermoids demonstrate
CSF like signal intensity. In such a situation fluid
attenuated inversion recovery (FLAIR ) sequences can
supplement conventional spin echo images in characterizing the lesion. Dermoids appear
hyperintense as compared to CSF on FLAIR images
and thus can be differentiated from CSF containing
arachnoid cyst.18 Keratin contents of dermoid and
epidermoids may be identified as free-water like in
some cases and FLAIR may not be characteristic in
such conditions.19 Identification of the lipid
component can also be done by chemical shift
selective-fat-water-imaging in which the water signal
can be suppressed and fat signal can be selectively
enhanced. A 3D- chemical shift selective gradient
echo imaging demonstrates excellent contrast
between fat, brain tissue and CSF with added advantage of demonstration of small amounts of free
lipid in CSF.9 Although there are no reports in
literature where MR spectroscopy (MRS) has been
primarily used for characterization of intracranial
dermoid on the basis of their fat content, the technique
demonstrates lipid content of dermoid, however, the
fat content varies in dermoid. MRS therefore may be
rarely required for a diagnosis of intracranial dermoid.
MRI with the available newer techniques can
therefore diagnose dermoids preoperatively and it also
shows with better conspicuity, the extent of
subarachnoid spread, involvement of extra-axial
structure and evidence of vascular compromise, which
may obviate angiography.8

Rupture of dermoid cyst results in spillage of its
contents into the ventricles and/or subarachnoid
space. Spread of cyst contents through the
subarachnoid and or ventricular system can be
followed by a wide spectrum of clinical
manifestations such as acute aseptic chemical
meningitis, vasospasm with consecutive infarction,
increased intracranial pressure or chronic
granulomatous arachnoiditis.5-15 Since the contents
have a low specific gravity, they usually float on top of
the CSF. Fat usually enters the ventricle by
transcerebral rupture of the tumor into the ventricle.9
There is no correlation between fat distribution and
clinical symptoms.5 Intraventricular fat can occlude
ventricular foramina, causing increased intracranial
pressure, which may be motion dependent due to
lower specific weight of lipids as compared to CSF.2
Arachnoiditis or chronic ventriculitis due to repeated
leakage of cystic contents into subarachnoid or
ventricular system may produce hydrocephalus or
mental deterioration. The resorption of the
subarachnoid fat is variable and is reported to be
present even after 6 years post surgery.

Differential diagnosis includes epidermoid cyst,
arachnoid cyst and cystic craniopharyngiomas. Cystic
craniopharyngiomas and arachnoid cyst can be
differentiated from dermoids based on signal
characteristics and demonstration of fat in dermoids
and using FLAIR sequences. Intradural dermoid cysts
are four to nine times less common than epidermoids.5
The location of epidermoid is more variable than that
of dermoid cyst and shows greater deviation from
midline. Following complete or near total excision of
the tumors, the recurrence is rare, contrary to
epidermoids that are known to recur. Patients’ age,
clinical history, location of the lesion, presence of
calcifications and low density on CT and demonstration of fat content on MRI favour the
diagnosis of the dermoid.

References
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