Removal of a teratoma in the pineal region using Nd-YAG laser beams.

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The Nd-YAG laser beams have a less vaporization effect and an excessive thermal effect in comparison with the CO₂ laser beams. In spite of these disadvantages, the Nd-YAG laser beams are more appropriate than the CO₂ laser beams in some neurosurgical operations. Since the Nd-YAG laser beams are transmitted by a flexible quartz fiber, which can be freely moved under the operative microscope. The Nd-YAG laser beams have greater hemostatic effects than the CO₂ laser beams and it appears suitable for removal of highly vascular tumors. Thus, because of its strong hemostatic effects and flexible quartz fiber, the Nd-YAG laser beams can be applicable widely to microneurosurgery especially to removal of deeply seated tumors. Using a Nd-YAG laser (Molelectron 8000), we have performed total removal of a large teratoma in the pineal region. From this experience, the vaporization effect of the Nd-YAG laser beams have been proved to be adequate for clinical use.

Case Report

This 9-year-old boy was admitted to our hospital for evaluation of headache and double vision progressing over the previous 3 months. Examination Physical examination was unremarkable. Neurological examination revealed bilateral papilledema, bilateral sluggish light reflex, diplopia (present in all directions of gaze) and upward gaze palsy. Serum HCG level was 25ng/ml. Plain skull X-ray films showed increased digital markings and separated coronal suture (Fig. 1). Computerized tomography (CT) disclosed marked dilatation of the third ventricle and both lateral ventricles, with a marked indentation of the posterior part of the third ventricle by a round area of mixed density. The area was speckled with high density spots, and measured about 3cm in diameter (Fig. 2). Bilateral vertebral angiograms demonstrated abnormal vessels from bilateral medial posterior choroidal arteries in the pineal region. Diagnosis of a teratoma in the pineal region was made.

Operation The pineal region was approached through the infratentorial-supracerebellar route keeping the patient in a sitting position on November 29, 1982. The arachnoid surrounding the pineal region was found to be thickened and the underlying venous anatomy was obscured. Dissection through the arachnoid revealed a circumscribed encapsu-

lated pearly tumor. The capsule was very hard and thick so that internal decompression of the tumor with tapping the cystic portion of the tumor and an incision of the capsule with a knife or scissors could not be done without causing either torsion or compression to the surrounding important neural structures. When the Nd-YAG laser beams were irradiated at a distance of 5mm, vaporization of the capsule could easily be accomplished at the energy level of 100watts, 0.5sec. Through this defect of the capsule, the tumor tissue was removed by suction. Because the tumor was multicystic, this procedure was repeated to gain enough internal decompression of the tumor. After decompressing the interior of the tumor, microdissection was carried out around the tumor capsule and total removal of the tumor was successfully accomplished. Postoperative CT scans showed no residual tumor (Fig. 3).

Pathological examination The histological diagnosis was a mature teratoma (Fig. 4).

Postoperative course The patient's recovery was uneventful in the postoperative period. The upward gaze palsy and diplopia resolved completely within 10 days of the operation.

(Fig. 1)

(Fig. 2)

(Fig. 3)

(Fig. 4)