ECTOPIC PINEALOMAS IN THE CHIASMAL REGION

REPORT OF THREE CASES*

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Our interest in the so-called ectopic pinealomas was stimulated some ten years ago by the autopsy findings in Case 1 of the present report. This patient was a young boy twelve years of age, whose outstanding symptoms were polydipsia and polyuria. X-rays of his skull, however, showed a large calcification in the pineal region associated with a pineal tumor. Death followed an exploration of the pineal region, and the pathologic examination carried out by Dr. Louise Eisenhardt disclosed the cause of the boy’s diabetes insipidus. It was due to an extension of the pineal tumor through the floor of the third ventricle to invade the hypophysis.

Since this original experience, we have had two further patients who have presented evidence of chiasmal lesions, and from whom at operation suprasellar tumors of pineal origin have been removed. One of these patients likewise had diabetes insipidus. In both instances the microscopic examination showed that the growth was a pinealoma of the so-called ectopic type. However, as Dorothy Russell8 has pointed out, it is probably better to regard most pinealomas as atypical teratomas, and this being the case the appearance of ectopic pinealomas in brain areas at a distance from the pineal region is more easily understood. This is undoubtedly true so far as some of the reported cases of ectopic pinealomas are concerned, but in at least one of our patients (Case 1) such an explanation would not be necessary since the tumor in the hypophysis was shown to have occurred by direct extension from the tumor in the pineal region along the floor of the third ventricle, and in another of our patients (Case 3) the chiasmal growth appeared subsequent to the operative removal of a primary pinealoma in the pineal region. It would seem likely, therefore, that this also was due to direct extension through the floor of the third ventricle, but as this patient subsequently died at his home and an autopsy was not obtained, no absolute verification of this assumption is possible.

Dorothy Russell’s arguments for her belief that most pinealomas should be regarded as atypical teratomas are nevertheless well founded. She points out that if serial sections of pinealomas are made, they frequently show teratomatous areas, and also that pinealomatos areas have been found in

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obviously atypical and typical pineal teratomas. The case reported by Bochner and Scarff is an excellent example of the latter. A further feature is the resemblance of pinealomas to spheroidal cell carcinomas of the testis which are widely regarded as atypical teratomas (Harris and Cairns). In this connection it is interesting to recall the case reported by Stowell, Sachs and W. O. Russell. These authors described a primary intracranial chorion-epithelioma which they believed had developed from one component of a pineal teratoma and that the rapidly growing chorionepithelioma had destroyed the original tumor together with all normal tissue in the neighboring pineal region.

From the clinical aspect there are numerous interesting features concerning the three cases we have to report. They are given in the chronological sequence of the dates when the patients came under observation.

Case 1. P. P., a boy aged 12 years, was referred by Dr. Harvey Cushing and was admitted to the New England Deaconess Hospital on July 7, 1936.

History and Present Illness. About one year prior to his admission the patient noticed that he was drinking large quantities of water and voiding similarly large amounts of urine. There was no change in his appetite. About the same time he began to have moderately severe frontal headaches coming once a week. Except for some modification of his polydipsia and polyuria as noted below, no essential change occurred in these symptoms until one month

Fig. 1. Ventriculogram (Case 1). Large circular calcification in pineal region (A); ventricular dilatation; filling defect in posterior portion of 3rd ventricle (B).
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previous to admission, when his headaches increased in frequency so that they came every other day, and were associated with nausea and vomiting. It was for these symptoms that he was referred for surgical treatment. He had lost weight and was greatly dehydrated when he came under our observation.

The patient had been studied at the New Haven Hospital from Oct. 23, 1935, until Nov. 1, 1935. At that time his blood pressure was 95/75, basal metabolic rate -21, and blood sugar 74 mg. per cent. During the above period his fluid intake without pituitrin or pituitary powder averaged 3,350 to 4,625 cc. and his output from 4,100 to 4,350 cc. per 24 hours. When the powder or pituitrin injections were given, however, his intake dropped to 500 to 1,800 cc. and his output to 800 to 1,900 cc.

From the time of his discharge from the New Haven Hospital, Nov. 1, 1935, until his admission to the New England Deaconess Hospital on July 7, 1936, his polydipsia and polyuria were said to have been adequately controlled by the pituitary powder.

While at New Haven an air encephalogram had been performed and showed ventricular dilatation together with the calcification in the pineal region. No surgical measures seemed indicated at that time since no symptoms of increased intracranial pressure were present.

Neurological Examination. The child was small for his age and obviously dehydrated in spite of the fact that he was drinking water and voiding almost constantly. He looked like a "little old man." His skin was dry and slightly rough. His hair was normal in amount and distribution for his age. There was no pubic hair and his external genitalia were immature. He
was mentally alert and had done well in his school work. Fundi and fields of vision were normal.

X-rays of the skull showed a circular calcified mass 11 by 12 mm. in two diameters in the region of the pineal body (Fig. 1).

**Operation.** On July 8, 1936, the day following his admission, a ventriculogram was carried out. This disclosed greatly dilated lateral ventricles and a shadow projecting into the posterior portion of the third ventricle anterior to the area of calcification (Fig. 1). This was interpreted as a pineal tumor.

Following the ventriculogram a right occipitoparietal craniotomy was performed and after incising the cortex down to the dilated lateral ventricle, an attempt was made to reach the tumor by this transventricular approach. The third ventricle was entered, and some supposed tumor tissue was removed. The calcification could not be identified. Microscopically the tissue that had been removed showed no tumor cells.

The child reacted poorly from the operation and in spite of all that could be done, he died 3 days later, on July 11.

**Pathological Studies.** The brain was removed, placed in formalin solution and sent to Dr. Eisenhardt in New Haven. After suitable fixation a single median sagittal section was made to show the general relationships of the tumor (Fig. 2).

Dr. Eisenhardt's description of the main tumor mass in the pineal region was as follows: "On histological examination it is seen to consist largely of dense tissue that has undergone hyalinization and calcification, at one margin of which there is an extensive cellular area of looser structure. This is composed of large spheroidal cells with vesicular nuclei and conspicuous nucleoli, intermingled with groups of smaller lymphoid cells with round nuclei and scanty
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cytoplasm (Fig. 3). There are occasional multinucleated cells and fairly numerous mitotic figures. Rare neuroglial cells are seen. Masses of cells are separated here and there by connective-tissue septa. Blood vessels are comparatively few in number. Some calcium deposits are present in this cellular area.

"The growth is composed essentially of cells characteristic of pineal parenchyma, and hence is classified as a pinealoma of adult type (Fig. 4). It appears to be fairly rapidly growing in its cellular portion."

Fig. 4. High power photomicrograph showing typical pineal parenchyma cells and small lymphocytic-like cells (Case 1).

This obvious tumor of the pineal region did not, however, explain the patient's diabetes insipidus; therefore Dr. Eisenhardt examined the hypophysis microscopically and found that the posterior lobe was massively invaded by the rapidly growing pinealoma. For this reason the region of the third ventricle was reexamined, and grossly this showed "a little greyish discoloration and unevenness of the surface along the posterior aspect of the wall." Dr. Eisenhardt took a block of this tissue for histological examination and found that it likewise was infiltrated with pinealoma.

As just noted, sections through both the pituitary and the hypothalamus revealed foci of tumor. The neoplastic cells were of the spheroidal cell-small round cell combination and these foci were superficial in their invasion. The tumor foci were found only in the pars nervosa of the pituitary gland and on section showed the characteristic structure of the accepted classical pinealoma (Fig. 5).

In the section from the hypothalamic region there was disruption of the ependymal layer and a poorly delimited superficial invasion of the underlying parenchyma with the pineal spheroidal tumor cells and a light shadowing of "lymphoid" cells (Fig. 6).

Discussion. Although we have had several other patients with diabetes
insipidus who have had clinical and ventriculographic evidence of pineal tumors (Horrax and Daniels), the case just reported is the only one in which gross and microscopic verification has been possible both as to the lesion in the pineal region and the extension of that lesion through the third ventricle and into the hypophysis, this extension being presumably responsible for the
polydipsia and polyuria. The case is somewhat similar to Case 3 of Dorothy Russell—a patient with diabetes insipidus who was operated upon by Hugh Cairns with partial removal of a large suprasellar tumor. The latter was microscopically an ectopic pinealoma, and at necropsy the tumor was shown to have invaded the third ventricle. The pineal body, however, contained only a small dermoid cyst and was otherwise normal except near its posterior end where there were “some ill-defined groups of cells similar to those forming the infundibular tumor.”

An extremely interesting and important example of an ectopic pinealoma in the region just posterior to the optic chiasm was reported by Stringer in 1934. In this patient there was a relatively small but typical pinealoma in the pineal body, and a microscopically similar growth localized to the tuber cinereum. This metastatic tumor had destroyed the tuberal group of hypothalamic nuclei and invaded the stalk of the pituitary gland, but was not further invasive. Neither growth had occasioned symptoms of increased intracranial pressure. The patient had suffered from diabetes insipidus for five months, his daily intake averaging 6,000 cc. and his output 5,000 cc. unless he was given pituitrin. One week before death his temperature rose to 109°F. and remained constantly at this level.

Another recently reported autopsy case of third ventricle invasion by a pinealoma was described by Kubik. In this instance, although diabetes insipidus was not present, the patient ran an intermittent fever from 99° to 107°F. which was attributed to the demonstrable involvement of the hypothalamus inasmuch as no other source of the fever was ascertained.

From the therapeutic standpoint it is our strong feeling in view of subse-
quent experiences with certain of the pinealomas that our patient should have been given at least a trial of roentgen therapy combined with a simple decompression. Certainly, some patients with definite neurological and ventriculographic evidence of pineal tumors have become symptom-free for many years on such treatment. 4

Case 2. S. F., a male child aged 12 years, was referred by Dr. H. Magendantz of Boston and was admitted to the New England Deaconess Hospital on Feb. 2, 1942.

As in Case 1, this patient's chief complaint was increased thirst and increased urinary output. The family history was of some importance in that the patient's maternal grandfather, maternal uncle and a cousin on the paternal side suffered from diabetes mellitus.

Present Illness. For the past 3 or 4 months the child had worn glasses because of poor vision with the left eye. About 2 months previous to admission, there had been spontaneous onset of polyuria and polydipsia necessitating the patient's voiding 3 to 4 times during the night. During these 2 months he had experienced bifrontal headaches with nausea and vomiting at times. He had also become nervous and irritable.

Physical and Neurological Examination. The child was bright and cooperative with rather precocious mentality. He was in the 8th grade at school and was a good student. He was small for his age, his height being 56½ in. and his weight 75 lb. His skin was dry and the hair on his scalp was fine and silky. The pupils were equal and reacted normally to light and accommodation. The ocular movements were normal in all directions and there was no nystagmus. Visual fields were not remarkable but showed some general contraction with slight tendency to bitemporal defects. The fundi and other cranial nerves were normal. There was a mild hypotonia and incoordination with the right hand and arm, but otherwise the neurological examination was negative.

The urine showed a specific gravity of 1.004 and the 24-hour total output was 3,140 cc.

X-rays of the skull, taken by Dr. Robins of Boston, disclosed an enlarged sella turcica measuring 15 by 15 mm. in two diameters. The floor of the sella was depressed into the sphenoid sinus. The posterior clinoid processes were thinned and pushed backward (Fig. 7 A).

A lumbar puncture which had been performed previous to the child's admission to the Deaconess Hospital showed a spinal fluid total protein of 67 mg. per cent.

Preoperative diagnosis: probably craniopharyngioma.

Operation. On Feb. 3, 1942 a right frontal craniotomy was performed. The dura was tense and 30-40 cc. of fluid were aspirated from the right lateral ventricle. This allowed retraction of
the right frontal lobe and a good exposure of the chiasmal region. The reddish, bulging surface of an obvious tumor appeared between the optic nerves, this tumor having the gross appearance of a craniopharyngioma. The left optic nerve was pushed upward and outward. The right nerve was compressed to a lesser degree. The capsule of the growth was incised and the solid contents were removed by pituitary spoons and by suction. In this way the tumor was gradually excised piecemeal down to the rim of the sella, and then the intrasellar portion was likewise removed. So far as could be told a very complete enucleation had been accomplished except for a few possible tags of tumor along the right internal carotid artery.

The child made an uneventful convalescence and was discharged home on Feb. 19, 1942.

_X-ray Treatment._ Between the date of discharge and May 28, 1942, the patient received 4,000 r units through each of three portals directed at the suprasellar region (total 12,000 r). From this time until the present the child has come in for frequent follow-up examinations. The following are brief records of the salient features of these check-ups.

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**Fig. 9.** Visual fields (Case 2) 1 year and 11 months postoperatively.

Note temporal defect of left field. Normal acuity.

Aug. 31, 1942. Polyuria and polydipsia were still present but not so marked as before operation. The visual fields had shown a rather marked temporal defect on the left after operation, but this was now somewhat improved.

Nov. 12, 1942. Height, 57 1/2 in. (a gain of 1 1/2 in.). Weight, 84 lb. (a gain of 9 lb.).

May 27, 1943. Height 58 1/2 in. (Fig. 8). No axillary hair. Small amount of pubic hair. Genitalia infantile. X-ray of sella was the same in size as before operation but bone was being laid down in the posterior clinoids and in the floor of the sella.

June 4, 1943. Fluid intake was 12 1/2 glasses per day compared to 17 to 20 glasses before operation.

Dec. 27, 1943. Visual fields still showed an upper left temporal defect, the right field being normal (Fig. 9). The patient had less nausea at night; less polydipsia and polyuria.

June 8, 1944. Height, 59 in. (gain of 2 1/2 in. since before operation). Weight, 100 lb. (gain of 25 lb. since before operation). X-rays of skull showed sella well calcified with measurements of 12 by 13 mm. as compared with 15 by 15 mm. preoperatively (Fig. 7B).

Jan. 5, 1945. Visual fields same as previously with 20/20 vision in each eye. Fundi showed some slight pallor of the disks.
June 15, 1945. Now voided only once at night—previously 3 to 4 times. Visual fields and acuity remained as before.

July 2, 1946. The patient had taken 10 mg. methyl testosterone for one month. He showed more hair on his legs, arms and in axilla. His penis was now about the size of that of a boy of 14 or 15 whereas the patient was now 17. Height and weight had remained unchanged. There was no further change in the appearance of the sella turcica. Visual fields still showed a partial temporal defect on the left with normal acuity of both eyes (Fig. 10).

Pathological Report. The first pathological report of this tumor seemed to indicate that it was a malignant growth from testicular origin but there was no clinical evidence of a tumor anywhere in the genito-urinary tract. Subsequently microscopic sections of the growth were submitted to Dr. Eisenhardt who diagnosed it as a pinealoma.

All the tumor fragments removed at operation were fixed in Zenker's solution, paraffin embedded and stained with eosin-methylene blue. Serial section studies all showed a relatively similar picture with two distinct types of cells present. The large cells measured between 20μ and 30μ with large nuclei measuring up to 20μ. The nuclei were round to ovoid, and the chromatin was most frequently arranged in a reticular or vesicular pattern. The cytoplasm was eosinophilic or amphophilic, and frequently with the nuclei placed in an eccentric fashion. These large cells were loosely arranged, sometimes with an alveolar pattern, in other places arranged in cords or masses. Interspersed between these cells were groups and infiltrates of small round cells with dense basophilic nuclei. These cells measured up to 10μ in diameter with scanty cytoplasm. The microscopic picture was that usually seen in the so-called typical pinealoma (Fig. 11).

Comment. From the purely clinical aspect this child has been in all respects the most satisfactory of our three patients. He has now survived 4½ years with his physical, visual and neurological status greatly improved and no evidence to date of tumor recurrence. He has had only one course of x-ray therapy following operation, as noted. So far as diagnostic criteria were concerned, there was every reason to suspect a Rathke's pouch cyst. Therefore, the pathological findings came as a complete surprise. It is most
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Fig. 11. Photomicrograph of tumor (Case 2) composed of large spheroidal cells and small round cells as seen in usual type of pinealoma. Compare with Fig. 12—a typical carcinoma of gonadal origin.

Fig. 12. Appearance of gonadal carcinoma for comparison with Fig. 11 to show the similarity to certain pinealomas.
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gratifying that his visual acuity and fields have remained nearly normal and that his polydipsia and polyuria have greatly diminished.

We are unaware of a similar long survival of any patient with a tumor of this type, but our experience with this child indicates that these growths are not all as malignant as they would appear to be microscopically. Whether the good result is to be attributed more to surgical removal or to the rather heavy dosage of x-ray therapy, there is no way of deciding. In any case, radical surgery followed by roentgen treatment would seem warranted in every such instance.

Microscopically the similarity between this tumor and some embryonal carcinomas of gonadal origin is shown by a comparison of Figs. 11 and 12, the latter being a photomicrograph of such a testicular tumor. This visual relationship has been previously depicted by Dorothy Russell who at the same time alluded to the feeling in some circles that the gonadal embryonal carcinomas are in reality teratomatous in origin.

A further point of interest is the recession in the size of the sella turcica.

**Case 3.** B. F., a young man 19 years of age, was referred by Dr. A. S. Rogers of Holyoke, Massachusetts, and was first seen at the Lahey Clinic on July 6, 1945, at which time he was complaining of pain in the side of his head and of failing vision.

Past History. (Kindness of Dr. J. E. Scarff of New York.) The patient had been operated upon by Dr. Scarff on Jan. 5, 1942, when a grossly complete enucleation of a pinealoma had been accomplished by an approach along the falx. The tumor was firm and somewhat lobulated. Microscopically it was a typical pinealoma (Fig. 13). Previous to this operation the patient’s vision had been good and his fundi had shown bilateral choked disks of 3D. His pupils did not react to light, and conjugate movements of the eyeballs above the horizontal were impossible. A ventriculogram had confirmed the diagnosis of a pineal tumor. The patient recovered well from the operation and during the subsequent year he was given 3 series of x-ray treatments. He remained perfectly well until January, 1945, when he had a recurrence of headaches and vomiting. These subsided after another series of x-ray treatments in February, 1945. He again remained well until about June 24, 1945, when his pressure symptoms recurred and during the next 2 weeks his vision failed rapidly from ordinary reading vision to the ability to read only large ¾ inch print with great difficulty.

Examination, July 6, 1945. The patient was a mentally normal individual with the scar of an old, well-healed craniotomy. Visual acuity on the right was 10/200 and on left 6/200. The fundi showed marked bilateral optic nerve atrophy without elevation. His visual fields showed extreme general contraction (Fig. 14). His pupils were small and equal and did not react to light but did react to accommodation. Upward conjugate movement of the eyeballs was almost nil. The ocular movements were otherwise normal. There were a few other inconspicuous neurological findings including slight areognosis, slight dysmetria of both hands and slight dysarthria. He showed a positive Babinski’s sign on the right and this was equivocal on the left. Knee and ankle jerks were absent on the right.

Roentgen Therapy. After this examination, the patient was advised to complete another series of x-ray treatments which had been started elsewhere in June, 1945, but since no benefit occurred following these treatments, he was admitted to the New England Deaconess Hospital on Aug. 23, 1945. By this time his vision had declined practically to blindness in the left eye although on the right it was 20/200. He had some headache and dizziness. His optic atrophy appeared to be more primary than secondary to his previous papilledema as the disks were sharply outlined and the blood vessels were not unusual.

On Aug. 30, 1945, an oxygen encephalogram was carried out. This disclosed dilatation of the lateral ventricles together with rounded defects in the anterior portion of the third ven-
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Fig. 13. Photomicrograph of pinealoma (Case 3) removed from pineal region by Dr. Scarff.

Fig. 14. Marked reduction of visual fields and acuity in Case 3.
tricle and of the under surface of the anterior horn of the right ventricle, indicating a probable tumor in this region (Fig. 15). The total protein content of the fluid removed was 160 mg. per cent. Because of these findings he was given a series of x-ray treatments directed toward the suprasellar region, since there was evidence that his original tumor had been radiosensitive. He was discharged Sept. 23, 1945.

![Fig. 15. Encephalogram (Case 3) showing dilatation of the lateral ventricles together with filling defects in the anterior portion of the 3rd ventricle and of the right frontal horn (arrows).](image)

On Oct. 22, 1945, he was readmitted to the New England Deaconess Hospital having received no benefit from the roentgen therapy. He had had several periods of drowsiness and vomiting since discharge and there had been no improvement in vision.

Operation. On Oct. 25, 1945 a right frontal craniotomy was performed. The chiasmal region was easily exposed by retraction of the frontal lobe after incising the dura along the sphenoidal ridge. A brownish-red tumor presented between the optic nerves, compressing them, and the right nerve was also pushed upward by this growth. The upper surface of the tumor was coagulated, and after being incised in circular fashion the solid contents of the mass were gradually removed piecemeal. This was extremely difficult to accomplish because of the firm, fibrous nature of the growth. A fairly thorough evacuation of the tumor was nevertheless obtained. The capsule was separated from the right optic nerve and from the chiasm and as much as possible excised from beneath those structures. It was extremely adherent along the chiasm and along the left optic nerve and any attempt to pull this portion of capsule away resulted in too much traction upon the nerve and chiasm so that no radical attempt was made to remove this part of the capsule. Both nerves, however, were freed from pressure as was the chiasm, and the completed excavation appeared similar to that which is obtained by the
intracapsular removal of a pituitary adenoma. The growth appeared to extend well down into the sella turcica.

Course. The patient made an uneventful convalescence and was discharged on Nov. 8, 1945. He showed no great change in his general condition. Vision with the right eye was 20/200 and with the left he could read the largest letter on the chart at a distance of 3 feet.

On Dec. 12, 1945 the patient reported for a check-up. He stated that he had had some slight temporary improvement in vision after the operation since when there had been a steady decline. At the present time vision was too poor to record in any way. His fundi showed complete optic atrophy. He complained of some moderate headache, nausea and vomiting.

Word was received that the patient had died on Feb. 15, 1946.

Pathological Report of Tumor. All the tumor fragments removed at operation were fixed in Zenker's solution, embedded in paraffin and stained with eosin-methylene blue. This constituted when compressed a 2 cc. mass of friable reddish tissue. Serial section studies were carried out on this material and all sections showed a similar picture, but in marked contrast to the material from Case 2. There was only a single dominant cell in the make-up of this malignant tumor. This cell was large, measuring up to 40 μ, and was arranged in masses or a fan-like syncytial mosaic pattern. Nuclei showed considerable variation in size and tinctorial reaction, but principally possessed a definite nuclear membrane, and vesicular chromatin with a centrally placed prominent nucleolus. Mitotic figures were numerous. Irregular foci of necrosis were sharply demarcated in the syncytial strands of these undifferentiated cells (Fig. 16). No infiltrate of small round cells was found, thus differing from the microscopic appearance of the original tumor (cf. Fig. 13). An occasional pseudoglandular structure or canalized element was noted, but no frank teratomatous regions were uncovered (Fig. 17).

The microscopic picture was that of an atypical pinealoma of undifferentiated embryonal type.

Fig. 16. Photomicrograph of tumor (Case 3). Note uniform type of cell with nuclear membrane and prominent nucleolus.
Comment. This was the only one of the three patients who showed the neurological signs frequently seen in patients with a tumor in the pineal region, namely, loss of pupillary reaction to light, and loss of the conjugate movements of the eyeballs upward above the horizontal plane. Apparently, the tumor in this situation had been very completely removed by Dr. Scarff, since the air study which we made 3½ years subsequently did not disclose any shadow protruding into the posterior portion of the third ventricle. In spite of this, however, the eye signs just noted remained unchanged.

The eventual optic atrophy which the patient showed was without much question due to direct pressure from the chiasmal tumor against the optic nerves, as the atrophy did not have the usual qualities of that which follows papilledema. The disks were sharply outlined and of a shiny, white color. The patient’s late drowsiness may doubtless be attributed to involvement of the hypothalamic region. In this connection there was every expectation that he should have had some degree of polydipsia and polyuria, like the other two patients, but this he never developed.

Another surprising feature was the lack of enlargement of the sella turcica by x-ray since at operation the growth appeared to invade the sella extensively.

In view of our two previous experiences with this type of lesion, it was possible to make a correct preoperative diagnosis of the chiasmal tumor in this patient. The clinical result, however, was disappointing in view of the excellent extirpation of the growth which was obtained by the operation but

Fig. 17. Pseudoglandular elements in some areas of tumor in Case 3.
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doubtless nothing more could have been expected after the highly malignant appearance in the microscopic sections was disclosed. It is quite possible that the chiasmal tumor had taken on different characteristics from the original pineal tumor removed by Dr. Scarff, as there was no evidence of recurrence of the latter after extirpation and X-ray treatment.

Microscopically, this tumor hinted at a teratomatous origin but no overt evidence could be found despite serial sections. In many regions the balloononed-out strands of undifferentiated cells were reminiscent of masses of Langhans’ cells as in a malignant choriocarcinoma, and the pseudoglandular elements also hinted at the diagnosis of teratoma, but these two features were only suggestive and were not proof positive of a teratomatous origin.

Recently Glass and Culbertson² have described a primary teratoma of the pineal body with regions of chorionicarcinoma showing features somewhat similar to this case.

SUMMARY

Three examples of the so-called ectopic pinealomas in the chiasmal region are reported. All three patients were Jewish boys between 12 and 19 years of age. In two of the patients a primary pinealoma in the pineal region was present and verified microscopically. In one of these patients the chiasmal growth was shown to have come by direct extension from the pineal tumor through the wall of the third ventricle; in the other, such an extension was presumed but could not be verified. In the third patient there has never been any clinical evidence of a primary tumor in the pineal region.

In two of the patients diabetes insipidus was the outstanding clinical complaint.

The chiasmal tumor was radically removed at operation in two instances, and one patient is alive and well after 4½ years.

Following Dorothy Russell’s thesis that ectopic pinealomas are in reality teratomata, serial studies on the material available were carried out in these three cases. In Case 3 only was there any suggestion of a teratomatous origin and here the visual proof was not conclusive. The other two cases are representative of classical pinealomas from the histopathologic aspect, with the first case showing regional spread to the pituitary and hypothalamic regions.

We wish to express our special appreciation to Dr. Louise Eisenhardt of New Haven, Connecticut, for her great interest and aid in the pathological features of the cases presented. We are indebted likewise to Dr. John E. Scarff of New York, New York, for furnishing material in connection with Case 3.

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