SYMPOSIUM ON PITUITARY TUMORS—I

SURGICAL TREATMENT OF PITUITARY ADENOMAS*

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The surgical treatment of pituitary adenomas is one of the fascinating chapters in the history of neurosurgery, but the end is not yet for I can foresee the addition of postscripts possibly for some years to come. Beginning with the courageous, though unsuccessful attempt by Sir Victor Horsley, 1889 (he reported it only in 1906) to remove a pituitary tumor intracranially, in the next 10 to 20 years other pioneers in surgery whose names are legend assailed the pituitary gland from below through the nasal cavities and above through various intracranial approaches.

Transphenoidal Operation. With variations, the transphenoidal approach to pituitary tumors was favored by most until the 1930's when it is obvious from the writings of those years that there was dissatisfaction with this approach and increasing interest and skill in the intracranial operation. In 1921 Cushing wrote: "It is certain that no one method is applicable for all conditions of pituitary tumor and that for some no satisfactory procedure has been devised. Speaking for myself, I find that I am conducting proportionately fewer rather than more transphenoidal operations." After the next 10 years, during which time there was a gradual transition from the transphenoidal to the transfrontal operation, he (Cushing), in support of better visualization afforded by the intracranial exposure, wrote: "Whereas 37 per cent of the patients after transphenoidal operations and 42 per cent after transfrontal operations showed considerable or marked improvement in vision, only 9 per cent of the transphenoidal operations, in contrast to 21 per cent of transfrontal operations, were followed by restoration of the visual fields and acuity essentially to normal. It is in this respect that the transfrontal procedure definitely takes precedence over the other."

In the years following, the intracranial approach has been more widely employed in surgery of pituitary adenomas, although both in America and elsewhere there have been advocates of the transphenoidal operation. No purpose would be served by an attempt to convert those who find favor in the transphenoidal over the intracranial operation and we should not lose sight of worth-while contributions that have come from such surgeons as Hirsch, whose monumental work extends over a period of half a century.

A few comments can be made in the present day on the comparative merits of the two operations. Some advocates of the transphenoidal operation make claim for its simplicity and harmlessness and for safety of the optic nerves; they minimize the risk of infection, spinal-fluid leaks, occasional difficulties in exposure of the sella, inadequacy in dealing with unanticipated suprasellar extensions or other tumors. One author, Deborsu, based on an experience of 80 transphenoidal operations for pituitary adenomas, reported at length on the difficulties. One remark in his résumé is revealing; he says once you have arrived at the floor of the

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sella there are "no more difficulties, only dangers."

The indications for the transphenoidal operation have been listed as follows: (1) aged subjects in the 60's in whom the risk of intracranial operation is said to be great; (2) those on the verge of blindness in whom the possible manipulation of the optic nerves from the intracranial approach might add to the damage; and, (3) those with cystic or acutely hemorrhagic tumors or with downward extensions believed to be inaccessible from above.

My (B.S.R.) experience is limited to the intracranial operation, but I am unimpressed by claims of specific advantage of the transphenoidal operation and should view with apprehension any trend to revive more extensive use of it. There is little risk to life or of important complications from intracranial attack on pituitary adenomas that have not extended beyond the immediately adjacent confines of the sella and these tumors are outside the scope of a transphenoidal operation. As an old surgical principle, "adequate exposure" remains sound. Not only does the intracranial approach provide the means for viewing the tumor and its relation to the important intracranial structures, but by this approach everything can be accomplished that is possible by the transphenoidal operation. Horrax's evaluation indicates that by comparison the transphenoidal operation affords two to three times less protection against recurrence of chromophobe adenoma.

Radiation Therapy. Perhaps a more important consideration in the management of pituitary adenomas is the place of radiation therapy. For more or less 30 years many neurosurgeons looked upon the use of radiation therapy for chromophobe adenomas with uncertainty, if not with actual reluctance. There can be no doubt now that a tumor dosage in the neighborhood of 4,000 r will sometimes obviate the need for surgery and it seems likely that a similar dosage given after surgical resection of the adenoma will provide some protection against recurrent growth of the tumor. There is doubt that postoperative irradiation facilitates the recovery of vision if it has been possible to perform an adequate operation.

The popularization of radiation therapy in recent years has posed several problems, not the least of which has been its misuse, principally by those who are inexperienced or uninformed and who believe operation is dangerous and unnecessary. It is not an unique experience to have encountered patients whose vision, already seriously damaged before treatment was initiated, failed to improve or became worse with radiation and who had been led to believe surgery could offer nothing better.

With the advent of more widespread use of trial treatment by radiation the neurosurgeon must be aware of an additional responsibility. He should have a knowledge of the patient’s progress during and after treatment, even if not always directly in charge of necessary frequent observations. He must develop some knowledge and conviction about when it is appropriate to interrupt or follow irradiation by operation and must not be guilty of accepting mediocre improvement or uncertain protection of vision as a compromise for operation.

A brief case report will serve to illustrate a few points.

A 40-year-old physician engaged in research had for several years been receiving replacement treatment for unexplained hypothyroidism and hypogonadism. The first suspicion of a pituitary adenoma followed the discovery of bitemporal hemianopsia after he was nearly run down by an unseen car. When the diagnosis was made, a tally of the many medical opinions showed a majority favoring radiation therapy. The treatment was given in two series (totalling 3,800 r, tumor dosage) over a period of 4 months and during this time weekly visual tests were performed (B.S.R.). Fig. 1 shows selections from these tests which graphically illustrate the transient reduction of vision occurring with each series of treatments. On termination of the treatment his vision was about the same as it had been before. Some of his advisors believed the visual changes irreversible, but for the patient his vision was not useful since his work depended on the use of a microscope. Prompt improvement followed operation.

The technique of radiation treatment currently recommended is different from that