Pituitary Apoplexy: Large Surgical Series With Grading System

David H. Jho MD, PhD; Beverly Biller; Pankaj Kumar Agarwalla BA, MS, MD; Brooke Swearingen MD

Massachusetts General Hospital (series institution); Allegheny General Hospital (current affiliate)

Introduction

Pituitary apoplexy is an infrequent event that can require timely management. Various terminologies involving “pituitary apoplexy” have been used throughout the literature to describe a heterogeneous spectrum. There is debate about which subsets can be treated medically alone or with elective surgery, rather than with early surgical strategies. We present a large retrospective series of 109 consecutive cases of pituitary apoplexy spanning two decades (1992-2012) at a single institution and identify subsets to encompass a comprehensive classification system.

Methods

We identified 139 potential patients from the Endocrine Inpatient Consult and Neurosurgery Pituitary Operative Databases. There were 109 patients meeting clinical and radiographic selection criteria, with 101 surgically and 8 medically treated cases. We reviewed medical records and imaging to analyze patterns of presentation, treatment, and outcomes.

Results

The majority of patients in this series presented clinically with “classical” pituitary apoplexy (97%), had MRI for evaluation (99%), underwent transsphenoidal surgery as their primary treatment (93%), and had pituitary adenomas on histopathology (90%). We placed patients into five grades based on clinical presentation. The overall tumor volume, cavernous sinus involvement, and suprasellar extension correlated with grade. Pituitary endocrine deficiencies also showed differences, with 67-100% of lower-grade (Grades 1, 2, 3) compared to 32-38% of higher-grade (Grades 4, 5) patients requiring no long-term endocrine replacement at follow-up. There was a trend for higher-grade patients to undergo earlier surgery following the onset of symptoms. Pre-treatment symptoms were resolved or improved in 92-100% of patients across all grades with good general outcomes for visual deficits and ocular motility problems, validating management decisions overall.

Conclusions

We recommend a simple yet comprehensive grading system to classify the clinical spectrum of pituitary apoplexy, with implications for management, outcomes, and categorization for future studies.

Learning Objectives

By the conclusion of this session, participants should be able to: 1) Define the five grades of pituitary apoplexy, 2) Identify effective treatment strategies depending on grade, and 3) Predict likely outcomes depending on grade.

Table 1: Clinical Presentation

- ***Headache*** 95 (***87%***)
- ***Visual deficits*** 43 (***39%***)
- ***Ocular paresis*** 39 (***36%***)
- ***Vomiting*** 36 (***33%***)
- ***Decreased GCS*** 14 (***13%***)
- ***Meningismus*** 8 (***7%***)
- ***Fever*** 2 (***<2%***)

Table 2: Pituitary Apoplexy Grading

Grade 1 - ***No symptoms*** 1 (***<1%***)
Grade 2 - ***Endocrinopathy only*** 2 (***<2%***)
Grade 3 - ***plus Headache*** 33 (***30%***)
Grade 4 - ***plus Ocular paresis*** 26 (***24%***)
Grade 5 - ***plus Visual deficits*** 47 (***43%***)

Table 3: Pathology

Non-functioning adenoma 81 (***74%***)
Prolactinoma 13 (***12%***)
Rathke's cleft cyst 8 (***7%***)
Acromegaly 3 (***<3%***)
Cushing's 1 (***<1%***)
Craniopharyngioma 1 (***<1%***)
PNET 1 (***<1%***)
Metastatic 1 (***<1%***)