

# Serum cortisol in the early postoperative period as predictor of remission in Cushing's disease

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## Introduction

Pituitary surgery is currently considered the preferred treatment for Cushing's disease (CD) and achieves remission in 55-85% of patients. Cortisol falls after surgery, so that early postoperative cortisol level has been used as predictor of remission. There's no agreement about optimal timing for cortisol measurement, with wide variability between centers.

## Objective

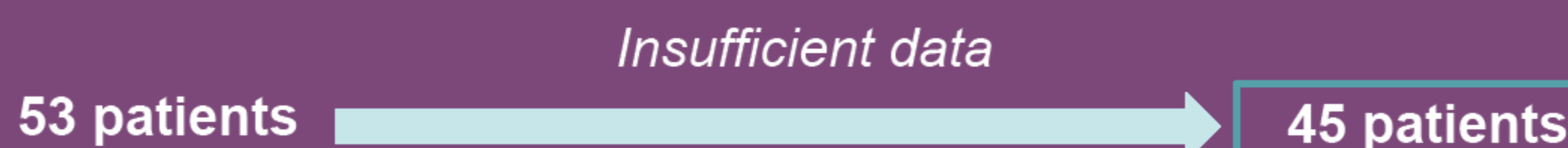
To assess the value of early (24hours) postoperative serum cortisol as predictor of remission after pituitary surgery in Cushing's disease.

## Methods

Cross-sectional, retrospective study of patients who underwent pituitary surgery for CD between January/1998-October/2013. No glucocorticoid replacement therapy was initiated until blood samples were drawn (8 a.m. the day after surgery).

- ✓ Serum cortisol (normal range: 7-25µg/dL), ACTH (normal range: <63.3ng/L), urinary free cortisol (normal range: 75-270µg/24h).
- ✓ **Remission** was defined as restitution of normocortisolemia **or** development of hypocortisolism requiring glucocorticoid replacement.

## Results



n	45
Age [years, mean (SD)]	38.2 (12.9)
Sex [n (%)]	
Male	6 (13.3%)
Female	39 (86.7%)
Follow-up [months, mean (SD)]	90.4 (56.7)

After pituitary surgery:

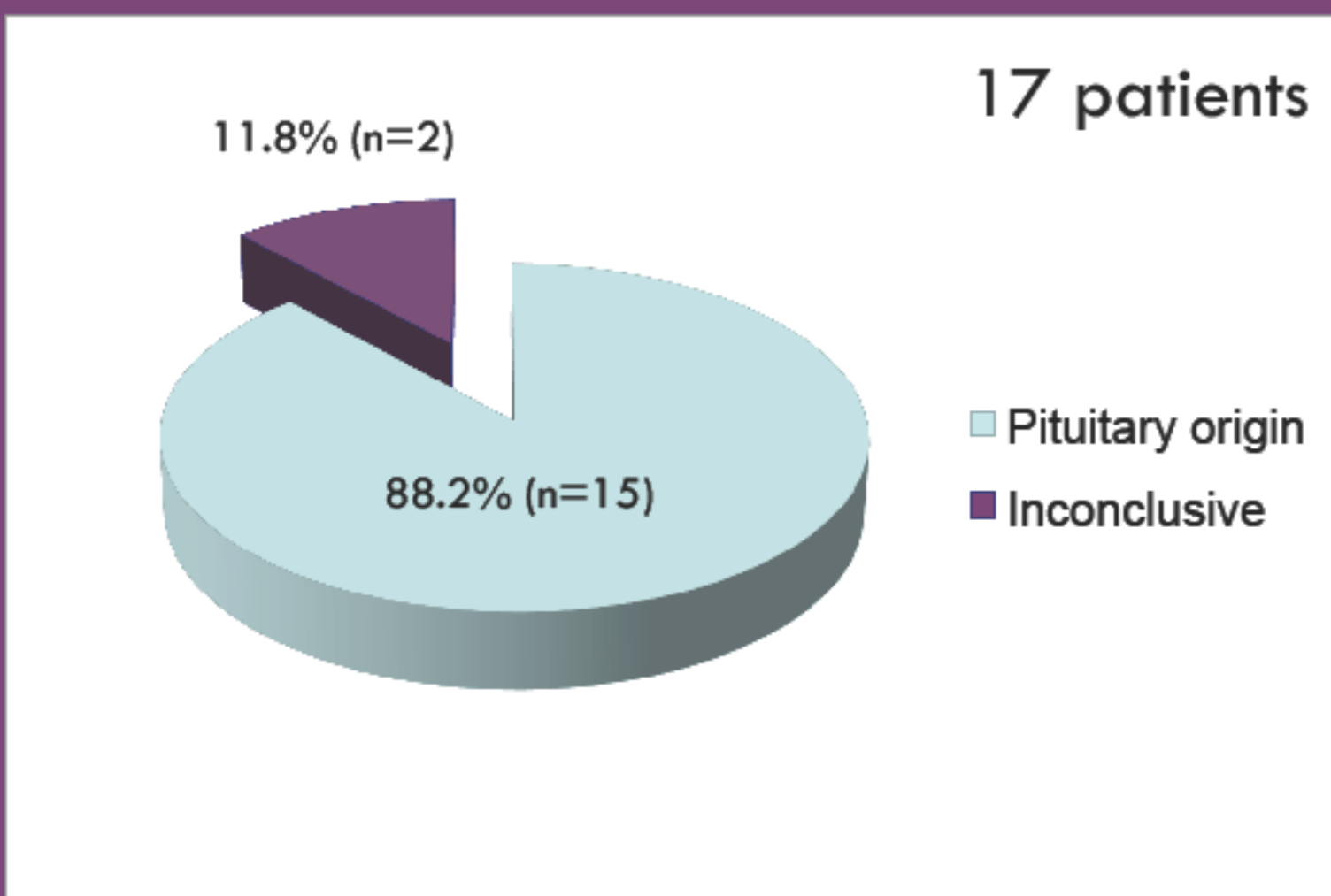
- ✓ 33 patients (73.3%) achieved cure
- ✓ 12 patients (26.7%) presented persistent disease
- ✓ 10 patients relapsed (30.3%) → mean follow-up time until relapse of 64.4±36 months

### BASAL HORMONAL MEASUREMENTS

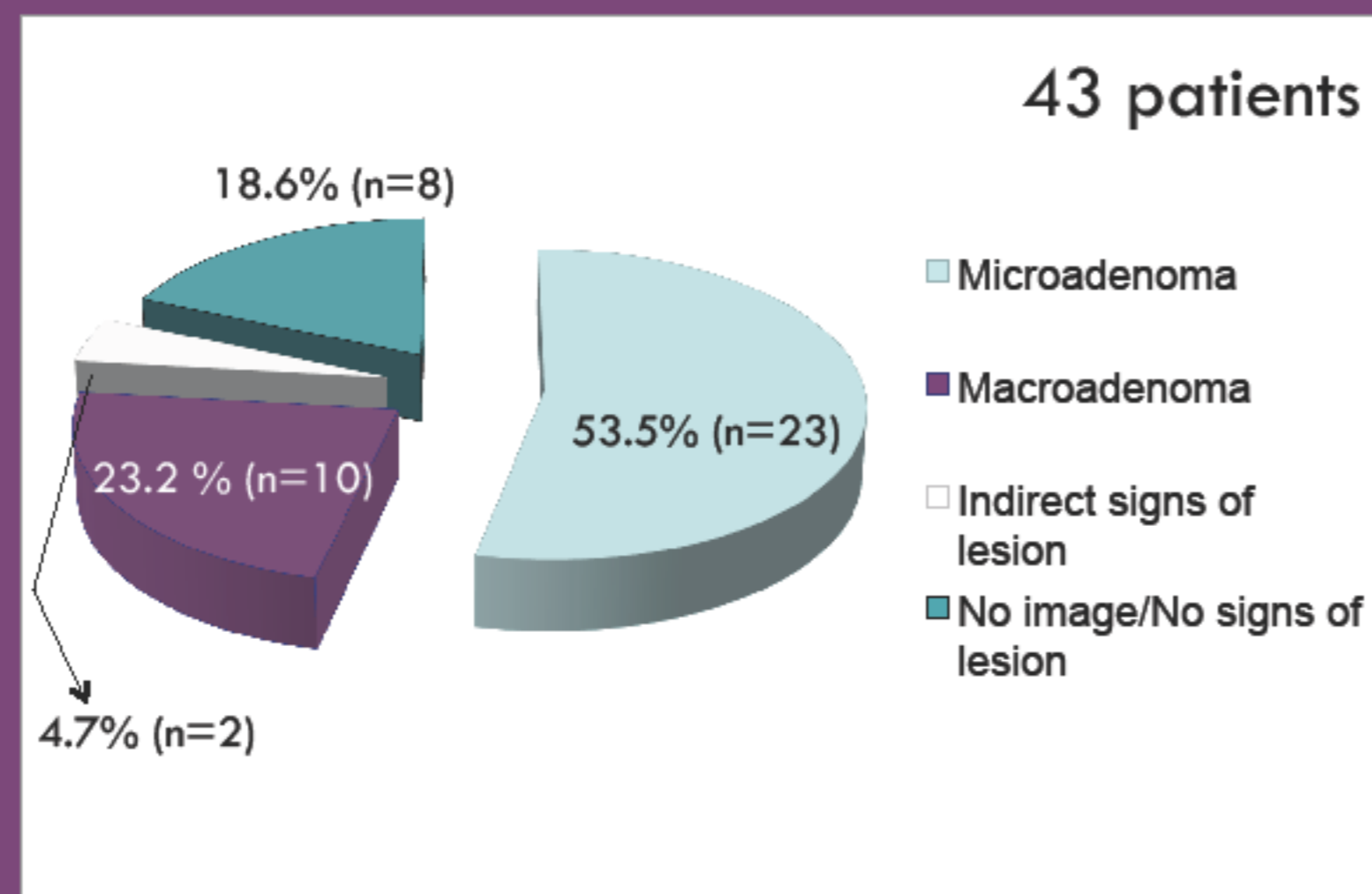
ACTH [ng/L, mean (SD)]	75.9 (41.3) (n=40)
Serum cortisol [µg/dL, mean (SD)]	27.5 (10.9) (n=39)
Urinary free cortisol [µg/24h, mean (SD)]	456.3 (406.2) (n=40)
Cortisol – Overnight dexametasone supression test [µg/dL, mean (SD)]	22.8 (15.5) (n=12)

*No significant differences* in urinary free cortisol, ACTH, serum cortisol and cortisol in the overnight dexamethasone suppression test at diagnosis *between patients with and without disease remission after surgery, or between patients with and without disease recurrence.*

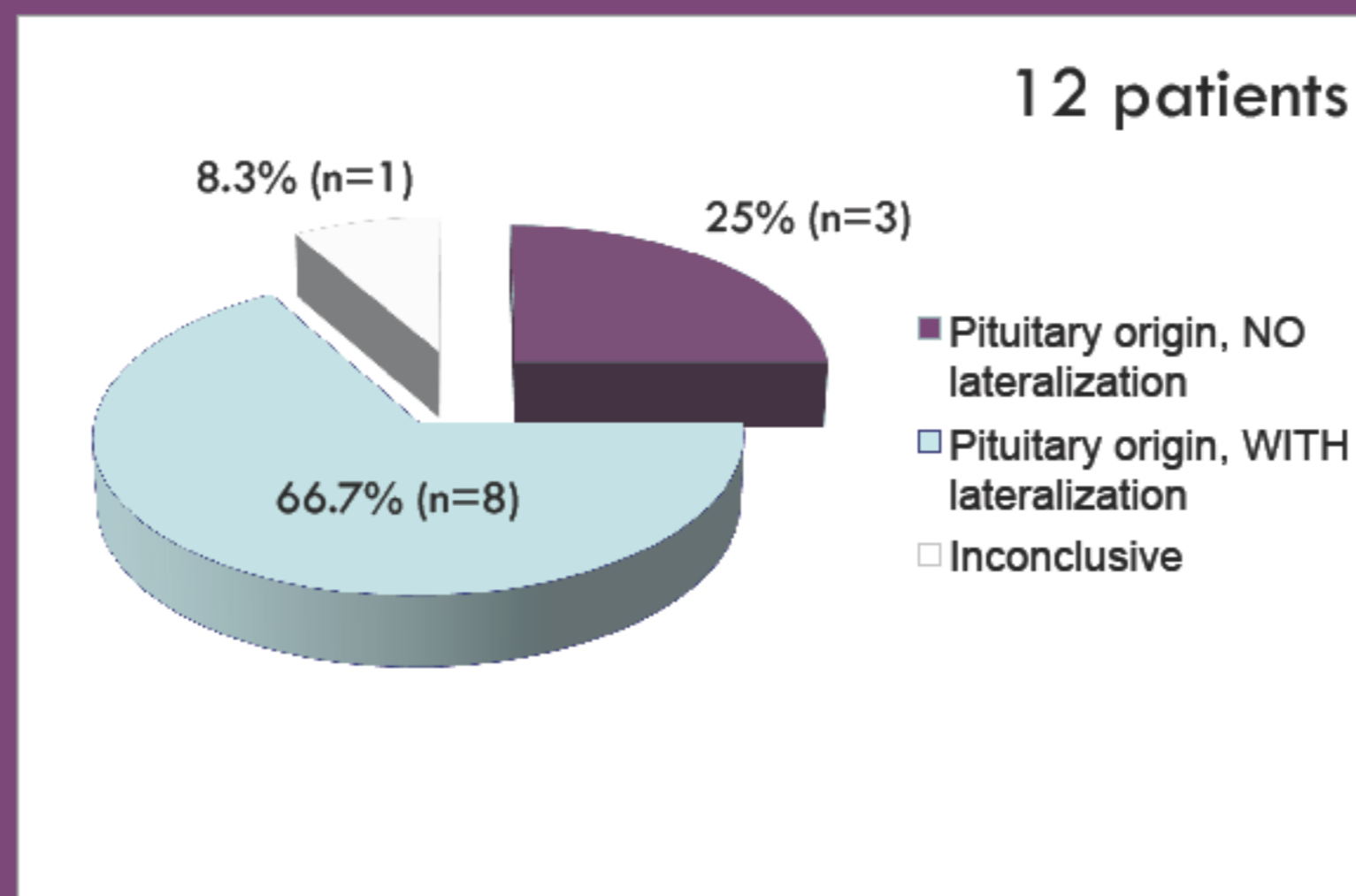
### CRH TEST



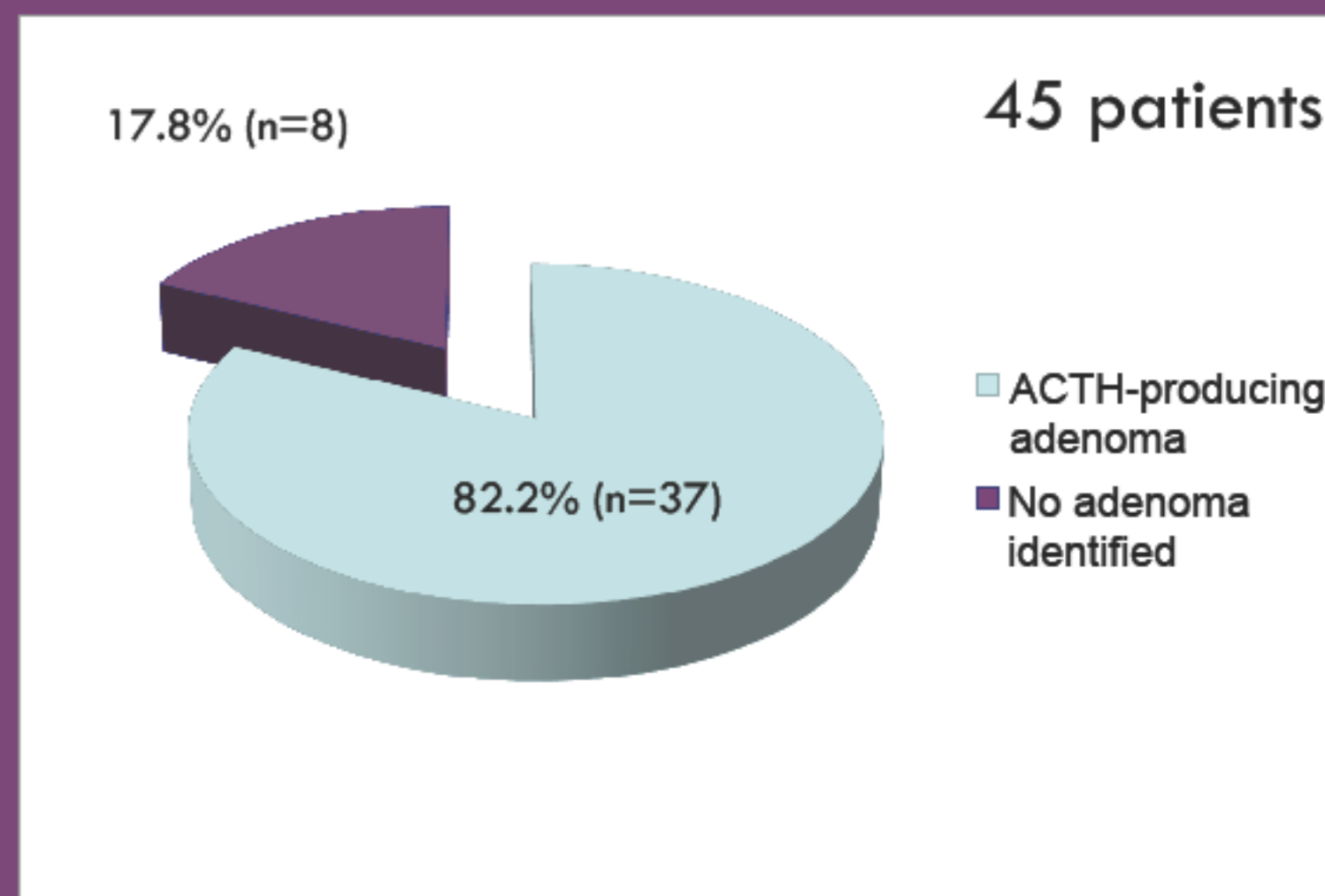
### MAGNETIC RESONANCE IMAGING



### INFERIOR PETROSAL SINUS SAMPLING



### HISTOLOGY



36 patients with morning serum cortisol the day after surgery



26 patients → remission after surgery

10 patients → persistent disease after surgery



24h postoperative serum cortisol [µg/dL, mean (SD)]	
Remission	12.2 (16.3)
Persistent disease	27.6 (19.3)
p	<0.05*

Despite this difference, the postoperative serum cortisol was not a good predictor of remission of CD (AUC<0.5).

## Discussion/Conclusion

Previous studies demonstrated that some patients have a delayed decrease to normal or low cortisol levels, without immediate postoperative remission. That could be explained by a gradual resolution of adrenal autonomy after pituitary adenoma resection, especially in the presence of significant bilateral hyperplasia. Moreover, gradual decline in cortisol during early postoperative period could be related to delayed adenoma necrosis. In our cohort, serum cortisol measured at 24 hours after pituitary surgery was not predictive of remission of CD. A longer interval between surgery and hormonal evaluation may allow a more accurate classification of these patients, including those with later remission.