



Perioperative Plasma Cortisol Levels during Transsphenoidal Operation of Pituitary Adenoma in ACTH Sufficiency and ACTH Deficiency

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Fig 1. ACTH sufficient pts without cortisone substitution

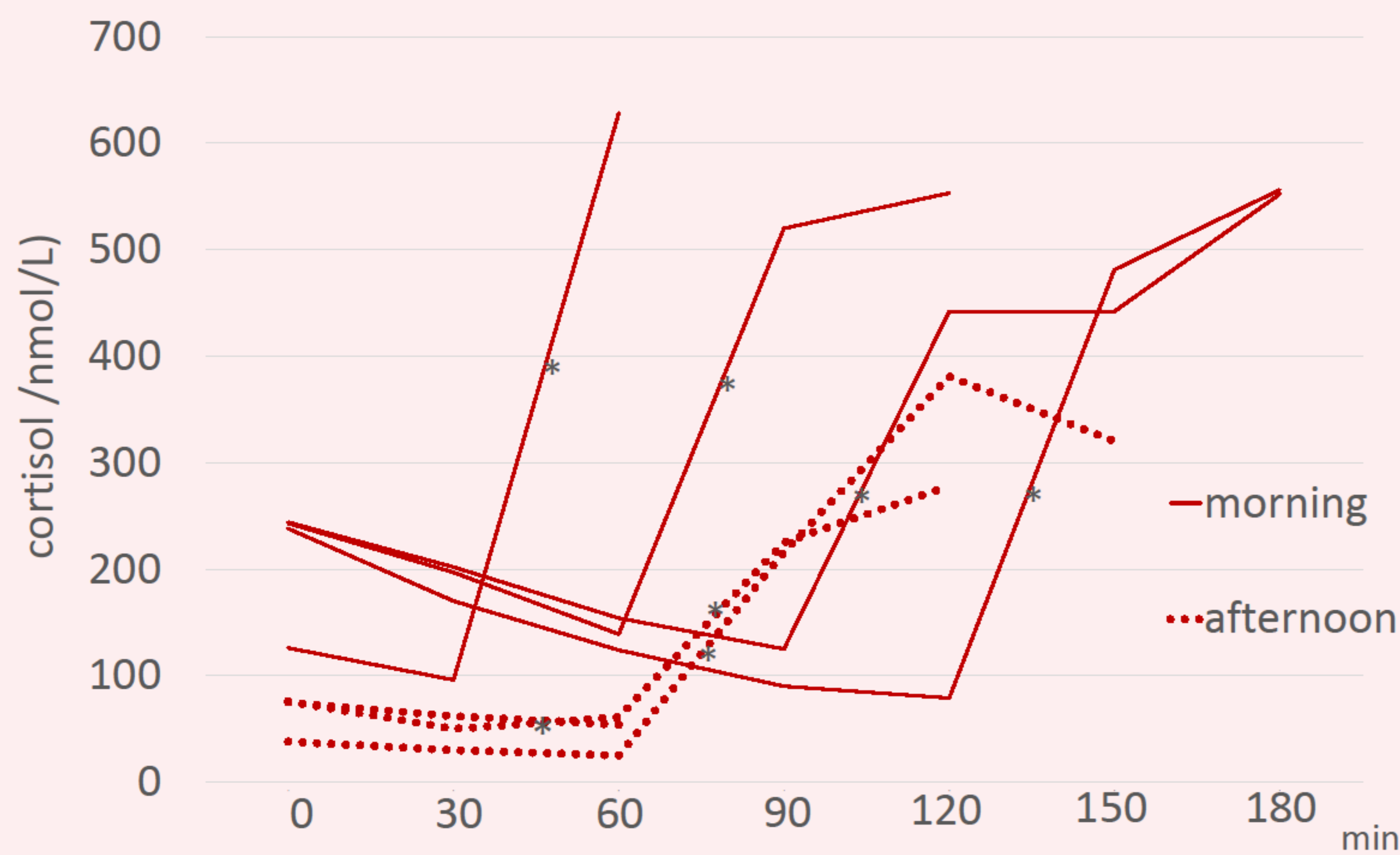
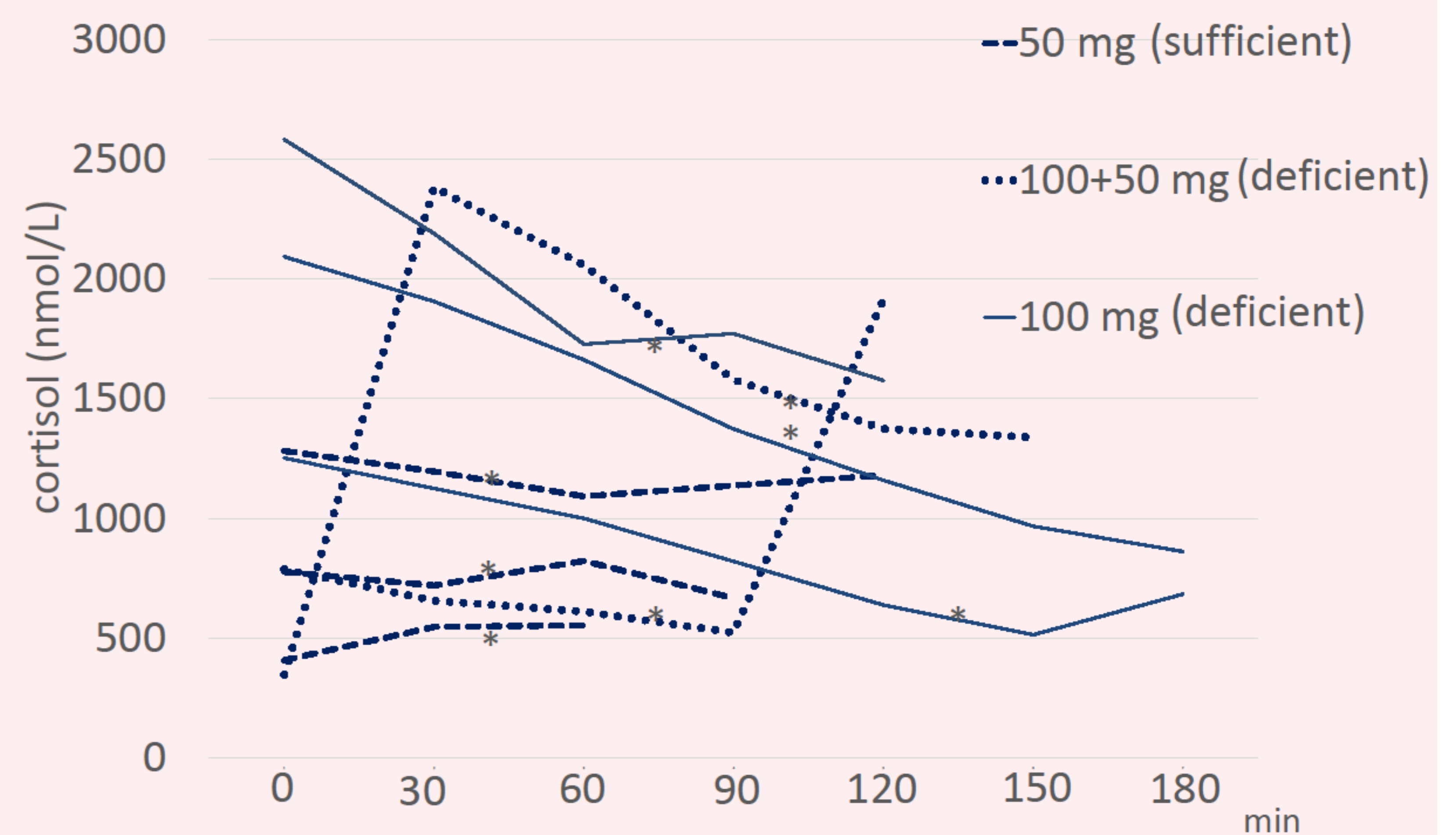


Fig 2. Pts with hydrocortisone substitution (ACTH sufficient and deficient)



Results I

ACTH sufficient pts (n= 7) not receiving cortisone substitution (Fig. 1)

At the start of surgery, cortisol levels were 38-244 nmol/L. Pts undergoing surgery in the morning (n=4) had 126-244 nmol/L, whereas those undergoing surgery in the afternoon (n=3) all had lower levels, 38-76 nmol/L.

During the first part of the surgical procedure, during entrance to the nasal cavity and paranasal sinuses, cortisol levels went down to 79-139 and 24-54 nmol/L in the morning and afternoon groups, respectively.

After surgery had reached into the sella tursica (*) rising cortisol levels were noted in 6 of 7 pts; rising with (Δ) 217-532 nmol/L up to 278-628 nmol/L.

In those who had surgery in the morning cortisol levels rose with (Δ) 402-532 nmol/L. In 2 of the 3 pts who had surgery in the afternoon cortisol rose with 217 and 356 nmol/L, respectively, whereas in one patient no increase was observed.

Introduction and objectives

Our aim was to measure the serum cortisol secretion during endoscopic adenoma surgery in ACTH sufficient and deficient pts.

Material and methods

15 pts with surgery for pituitary adenoma were studied. Ages were 28-84 years. Serum cortisol was measured every 30 minutes from the start of surgery. The anesthetics used were propofol plus remifentanyl.

10 pts had normal ACTH function, defined as a p-cortisol >400 nmol/L in the morning or >550 nmol/L after a 250 µg ACTH stimulation test. Of the 10 pts 7 were not given any perioperative hydrocortisone (HC) supplementation (Fig. 1), whereas 3 of 10 got the routine 50 mg intravenous HC at the start of anesthesia (Fig. 2). Five pts with known ACTH deficiency received the routine iv HC; 3 pts got 100 mg in the morning before surgery, and 2 got 100 mg in the morning plus 50 mg during surgery 8 hours after the first dose as they had surgery in the afternoon (Fig. 2).

Identifier/Topic: Pituitary - Clinical

Conclusions

Cortisol levels increased after mechanical impact on the pituitary with normal ACTH function.

The highest increases were observed in pts without cortisone replacement who had morning surgery.

The low cortisol levels during the first part of surgery may partly be caused by the anesthetics used, propofol and remifentanyl.

Very high cortisol levels were achieved after our routine iv hydrocortisone substitution.

Postoperative cortisol function

Cortisol levels were measured on day 3 after surgery; 8 of 10 pts retained normal adrenal reserve, whereas the remaining 2 were given oral hydrocortisone replacement therapy at discharge from the hospital.

Results II

ACTH sufficient pts receiving 50 mg hydrocortisone (Fig. 2)

All 3 pts had surgery in the morning. During the first part of surgery cortisol levels went down, but after entrance into the sella (*) the cortisol levels rose somewhat again, with (Δ) 7-146 nmol/L. The rise in these pts was lower than the rise seen in the 6 pts without hydrocortisone substitution.

ACTH deficient pts (Fig. 2)

In the 3 pts who had received 100 mg hydrocortisone substitution, cortisol levels started high and fell during surgery, from 1252 to 513, 2094 to 862, and 2582 to 1577 nmol/L, respectively.

In the 2 pts who had surgery in the afternoon and received additional 50 mg HC during the operation, cortisol levels peaked after the second dose at 1914 and 2384 nmol/L, respectively.

Two of the 5 pts, both with surgery in the morning, showed increases in cortisol levels with (Δ) 44 and 170 nmol/L, respectively, after intrasellar manipulation (*). In the other 3 pts cortisol levels decreased.