

Evaluation of pituitary function in patients with traumatic maxillofacial fractures: preliminary results

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OBJECTIVES

Traumatic brain injury (TBI) is a worldwide public health problem and has been recently documented as a cause of neuroendocrine dysfunction. TBI-induced hypopituitarism remains a relevant medical problem, affecting a significant proportion of the populations tested. The great majority of these patients may not be diagnosed, and will thus be withheld from adequate hormone replacement therapy. It has been shown that hypopituitarism may develop nearly in 10-20 % of the TBI patients and sports related head trauma, and most common pituitary hormone deficiency after TBI was growth hormone deficiency (GHD) (1, 2, 3). To date no study has demonstrated the relation between isolated maxillofacial fractures and hypopituitarism. Therefore we aimed to investigate pituitary function in patients with traumatic maxillofacial fracture without TBI.

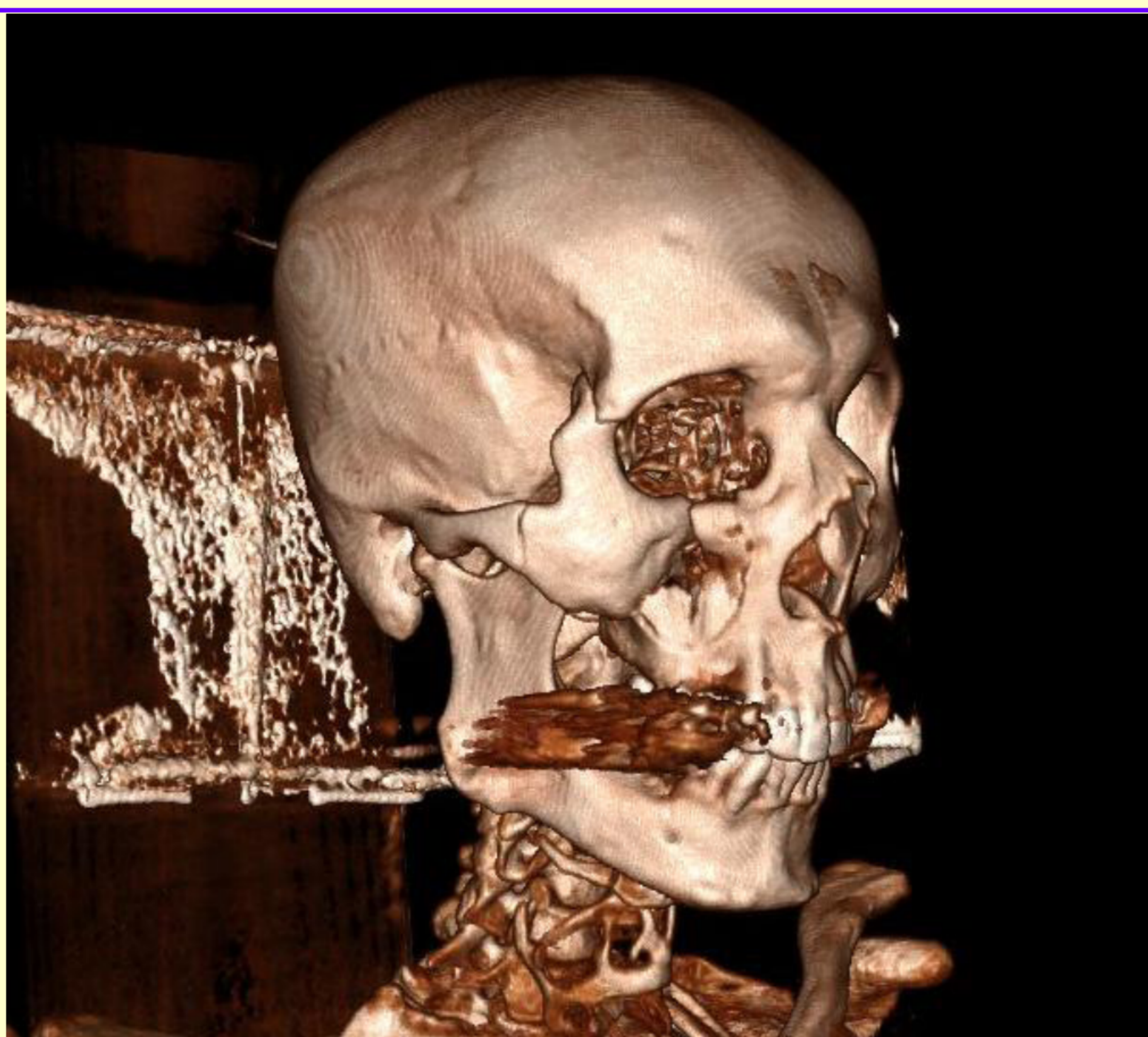


Figure 1: Maxillofacial fracture in one of the patients

METHODS

Thirty patients were included in the study retrospectively who had traumatic maxillofacial fracture at least 12 months ago (mean 33.6 months). None of the patients loss of consciousness after head trauma and they did not need intensive care screening. Basal hormone levels, Glucagon and 1 µg ACTH stimulation tests were performed to investigate pituitary function (4).

Table 1: Demographic and hormonal data of patients with maxillofacial fracture

	Normal pituitary function (n=26)	Abnormal pituitary function (n=4)	P value
Age (years)	37.9 (18-63)	52.2 (41-63)	0.058
Waist Circumference (cm)	87.4±10.2	89.25±11.2	0.669
Body Mass Index (kg/m ²)	25.4±2.6	26.2±2.6	0.76
Free T ₄ (ng/dl)	1.2±0.15	1.15 ±0.19	0.927
Free T ₃ (ng/dl)	3.46±0.45	3.27 ±0.21	0.344
TSH (U/L)	1.32±0.66	1.15 ±0.78	0.522
FSH (U/L)	7.1±6.67	6.29±1.75	0.36
LH (U/L)	6.74±4.89	5.45±0.95	1
Total Testosterone (ng/L)	469.7 ±144.4	564.1±239.2	0.477
Basal Cortisol (µg/dl)	10.9±4.8	11.9±5.2	0.855
IGF-1 (ng/ml)	186.9 ±71.5	160.5±35.3	0.669
GST peak GH (ng/ml)	6.78 ±5.6	0.43±0.15	0.002
GST peak cortisol (µg/dl)	20.08 ±7.71	16.77±4.19	0.393
ACTH ST peak cortisol (µg/dl)	24.45±6.14	21.46±4.77	0.329

FSH= follicle-stimulating hormone; GH=growth hormone; GST= glucagon stimulation test; IGF-1 insulin-like growth factor I; LH= luteinizing hormone; T3= triiodothyronine; T4= thyroxine; TSH= thyroid-stimulating hormone; ACTH ST= adrenocorticotrophic hormone stimulation test.

RESULTS

Twenty-six of 30 patients (86.7) were male and 4 patients (13.3%) were female, and mean age of the study group was 39.8 years (18-63). The type of maxillofacial fractures were as follows: One patient had blow out, seven patients had Lefort 1-2, six patients had mandibula, three six patients had nasal and thirteen six patients had zygoma fractures (Figure 1). Four of 30 patients (13.3%) had isolated GH deficiency based on glucagon stimulation test (GST). Mean peak GH level after GST in patients with hypopituitarism (0.43 ng/ml) was significantly lower than the patients without hypopituitarism (6.7 ng/ml) ($p < 0.002$). Other anterior pituitary hormones were normal in all patients, and none of them had diabetes insipidus. Demographical and hormonal values are summarized in Table 1.

CONCLUSIONS

These preliminary results suggest that there is substantial risk for hypopituitarism, GH deficiency in particular, during the chronic phase of traumatic maxillofacial fractures. However these findings need confirmation with further prospective studies with higher number of patients.

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