

Recurrent hypercalcaemia in a patient with dual urological malignancies: A rare life-threatening entity

Sir,

We present a case that describes the intraoperative detection and management of hypercalcaemia in a patient with biopsy-proven dual malignancies- squamous cell carcinoma of the penis and adenocarcinoma of the prostate.

A 68-year-old male of the American Society of Anesthesiologists (ASA) physical status I, presented with biopsy-proven moderately differentiated squamous cell carcinoma of the penis and lower urinary tract symptoms. After complete metastatic workup, he was scheduled to undergo total penectomy with bilateral inguinal lymph node dissection and transrectal ultrasound-guided biopsy of the prostate. He was reviewed by an anaesthesia resident the night before surgery and informed consent was taken. In the preoperative holding area, he was found to be slow to react to verbal commands

but was conscious and oriented. There were no focal neurological deficits and his haemodynamic status was acceptable, apart from some dehydration. Preoperative investigations were reviewed again and were found to be acceptable. It was decided to go ahead with the surgery under epidural anaesthesia. Two wide bore peripheral lines were inserted for correction of dehydration and standard ASA monitors were attached. A venous blood sample was sent for blood gas analysis that revealed ionised calcium level of 2.1 mmol.l^{-1} and serum lactate of 2.9 mmol.l^{-1} . Venous blood samples were sent to the laboratory for investigations like a complete haemogram, serum electrolytes including sodium, potassium, calcium, magnesium and inorganic phosphate, serum albumin and serum urea and creatinine. The total serum calcium was found to be 18.4 mg/dl intraoperatively.

Hydration with 0.9% NaCl was initiated targeting a urine output of $100\text{-}150 \text{ ml.h}^{-1}$ and injection salmon calcitonin 4 IU.kg^{-1} (240 IU as his weight was 59.5 kg) was administered intramuscularly. Injection zoledronic acid 4 mg in 100 ml of normal saline was administered intravenously over 15 minutes. Constant verbal communication was maintained throughout the surgery to assess his neurological

status. The entire intraoperative period (5 hours 45 minutes) was uneventful and the patient was shifted to the intensive care unit postoperatively. His serial corrected total serum calcium levels were estimated [Table 1].

Improvement of his neurological status paralleled correction of the total serum calcium levels and he was discharged on the 10th postoperative day. Intact parathyroid hormone (PTH) was below normal {12.05 pg.ml⁻¹ (reference value: 15-65 pg.ml⁻¹)} and parathyroid hormone-related protein (PTHrP) was grossly elevated [64 pmol.l⁻¹ (reference <1.5 pmol.l⁻¹)]. Multiple myeloma was excluded due to the normal levels of immunoglobulins (IgA, IgM and IgG) and normal kappa to lambda ratio in serum light chain assay. He was readmitted within a week from discharge with the same complaints and laboratory investigations revealed recurrent hypercalcaemia. Positron Emission Tomography-Computed Tomography (PET-CT) scan was negative for distant metastasis. Similar conservative management was continued till discharge and a poor prognosis was explained. He, unfortunately, succumbed a month later.

Hypercalcaemia of malignancy is commonly associated with breast, lung, urinary bladder, renal and ovarian cancers as well as haematological malignancies but is rarely reported in penile and prostatic cancers.^[1,2] Patients with humoral hypercalcaemia of malignancy usually have advanced disease and poor prognosis.^[3] They are mostly symptomatic with acute and rapid elevations of serum calcium levels. These patients have low serum intact PTH and an elevated serum PTHrP. Prognostically, serum PTHrP concentrations above 12 pmol.l⁻¹ are usually associated with both, a smaller reduction in hypercalcaemia and with recurrence of hypercalcaemia within 14 days of therapy.^[4]

Table 1: Serial corrected total serum calcium levels

	Total serum calcium (mg. dl ⁻¹)	Serum albumin (g. dl ⁻¹)	Corrected total serum calcium (mg. dl ⁻¹)
On the day of surgery	18.4	2.7	19.44
On the day of surgery after initial management	15.8	2.7	16.84
Postoperative day 1	13.2	2.7	14.24
Postoperative day 2	10.7	2.4	11.98
Postoperative day 4	7.6	2.1	9.12
Postoperative day 6	6.6	2.2	8.04

The diagnostic approach for hypercalcaemia aims to distinguish between the two most common causes of hypercalcaemia: primary hyperparathyroidism and malignancy.^[5] The low intact PTH concentration with a gross elevation of serum PTHrP in our patient clinched the diagnosis of humoral hypercalcaemia of malignancy. Vitamin D toxicity as a cause of hypercalcaemia may also present with altered sensorium^[6,7] and was excluded in our patient based on a negative history of intake of any supplements.

A single serum calcium level assessment can help in early diagnosis and subsequent prompt management in any patient suffering from an invasive malignancy, with or without obvious clinical signs of hypercalcaemia.

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Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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