

## Denosumab as a Bridge to Surgery in a Patient with Severe Hypercalcemia Due to Primary Hyperparathyroidism in the Setting of Renal Dysfunction

Sir,

We report a case of primary hyperparathyroidism (PHPT) with severe hypercalcemia (15 mg/dL) in the background of renal dysfunction, in whom denosumab (60 mg subcutaneously) was used to lower the calcium levels prior to surgery. Our patient was a 60-year-old gentleman who presented with chronic kidney disease and with medullary nephrocalcinosis (estimated Glomerular filtration rate (GFR) of 21.35 mL/min/1.73 m<sup>2</sup>). His albumin corrected serum calcium at presentation was 15.28 mg/dL and intact PTH was 1,850 pg/mL ( $N = 8-50$ ). He was treated with saline diuresis and parenteral salmon calcitonin with which calcium declined to 12.6 mg/dL. However, after 72 h, his serum calcium levels increased and remained >13 mg/dL. Further, to manage the refractory hypercalcemia in the background of kidney disease, we chose denosumab, a RANKL inhibitor, over bisphosphonates due to low GFR.<sup>[1]</sup> Following administration of denosumab, his calcium level reduced to 10.8 mg/dL and he underwent focussed parathyroidectomy 5 days later. After

curative parathyroid surgery, his calcium remained normal and there was no evidence of hungry bone syndrome.

Though bisphosphonates are widely used and approved for the treatment of hypercalcemia, the risk of potential nephrotoxicity precludes its use in those with renal impairment.<sup>[1]</sup> Although calcimimetic like cinacalcet has been utilized in PHPT, its impact on reducing calcium is not usually immediate and worsening of nephrocalcinosis has been reported in literature.<sup>[2]</sup> Denosumab is an option in such patients and in those with hypercalcemia that is refractory to bisphosphonates. Denosumab interferes with RANKL signaling and thereby inhibits bone resorption.<sup>[3]</sup> Unlike bisphosphonates, it is not cleared by the kidney, and hence, there is no restriction of its use in patients with chronic kidney disease.<sup>[4]</sup> Though Denosumab has been approved and used for hypercalcemia of malignancy, there are limited case reports on its use in patients with refractory hypercalcemia secondary to PHPT prior to surgery.<sup>[5]</sup> Though the median time to response (time taken to lower calcium to <11.5 mg/dL) for Denosumab has been

described as 9 days (7–10 days),<sup>[6]</sup> in our patient, calcium decreased by day 3. In view of its renal safety and quick action, it is a potential drug for lowering calcium levels especially in those with renal impairment.

### 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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Nil.

### Conflicts of interest

There are no conflicts of interest.

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