An interesting case of reversible metabolic myopathy: Tumor induced osteomalacia

Sir,

A 56-year-old male patient presented to the department of Neurology with the complaints of generalized body pains for 2 years and difficulty in walking since the past 1 year. He was apparently asymptomatic 2 years back; then he initially developed severe myalgia, which was intermittent, exacerbated by work, dragging in nature and relieved by rest. This progressed to difficulty in getting up from the squatting position and in reaching for objects above shoulder height, followed by difficulty in climbing stairs. These symptoms were progressive and eventually the patient became chair bound. He denied any history of paresthesias, bowel or bladder disturbances or symptoms suggestive of cranial nerve involvement. History was also negative for diurnal variation of complaints or fever, rash, joint pains and weight loss. He has hypertension and hypothyroidism which are well-controlled with telmisartan 40 mg and levo thyroxine 50 mcg/day. Past history includes fracture of the left femur due to trivial trauma a year ago.

On examination, his vitals were normal with blood pressure of 130/80 mm of Hg. Central nervous system examination revealed 2/5 power in proximal group of muscles in both upper and lower limbs and 4/5 power in distal group of muscles, which was associated with severe tenderness in both muscle groups. Rest of the nervous system examination including reflexes, sensory system was normal. Other system examination including heart, lungs and gastro-intestinal system was normal. As routine biochemistry thyroid function tests and electroencephalography were normal, patient was referred to Department of Endocrinology to rule out any metabolic myopathy.

Investigations: Serum calcium 8.6 mg/dl (8.4-10.4), phosphorus 1.5 mg/dl (2.5-4.6), albumin 3.8 g/dl (3.5-5.0), alkaline phosphatase 410 IU/l (32-91), 25 (OH) vitamin D 38.1 ng/ml (30-100), intact parathyroid hormone (iPTH) 114.5 pg/ml. The ratio of phosphorus tubule maximum to glomerular filtration rate (TmP/GFR) was 1 (2.5-4.5) suggestive of hypophosphatemic rickets. Considering patient's age and recent onset of symptoms, tumor induced osteo-malacia (TIO) was suspected. Fibroblast growth factor 23 (FGF-23) levels were 6600 RU/ml (0-180) and 68Ga-dotanac positron emission tomography scan (68Ga-dotanoc PET computer tomography [CT]) was positive for an occipito parietal lesion with soft-tissue component [Figure 1]. Magnetic resonance imaging showed an intracranial extra dural soft-tissue tumor in occipito parietal region. Patient underwent surgery with removal of the tumor and repair of the dura mater. Histopathology of the tumor revealed a phosphaturic mesenchymal tumor [Figure 2].

In the post-operative state patient improved symptomatically with normal phosphorus levels (3.8 mg/dl) and as expected he developed hypocalcemia on post-operative day 5, which was managed by intravenous calcium and calcitriol. On post-operative follow-up 2 months later, patient is doing well and came to the out patient department walking, with a corrected serum calcium of 9.0 mg/dl, phosphorus 3.5 mg/dl and normal FGF-23 of 24 RU/ml.

TIO or oncogenic osteomalacia is a rare paraneoplastic syndrome that is characterized by phosphate wasting due to increased levels of a variety of circulating phosphatonin (FGF-23, matrix extracellular phosphoglycoprotein [MEPE] etc.)

Figure 1: 68Gallium dotanoc positron emission tomography scan was showing an occipito parietal lesion with soft-tissue component

Figure 2: Histology in ×400 was showing ostoclast giant cells with distinctive “grungy” calcified matrix and prominent vascularity in the specimen
secreted by small usually benign mesenchymal tumors,[1] which are sometimes difficult to localize. Clinically, patients present with weakness, fatigue, diffuse aches, myopathy and bone pain from osteomalacia.[2] They may also sustain multiple fractures due to poor mineralization of bone and biochemically it is characterized by low serum phosphorus, low urinary phosphorus reabsorption, low or inappropriately normal 1,25(OH)2 vitamin D, high FGF-23 and high PTH. Diagnosis is made by functional imaging[3] (fluorodeoxyglucose PET CT, 68Ga-dotanoc PET CT and if needed, venous sampling with FGF-23 measurements).

Surgery with wide excision of tumor is the treatment of choice and which is curative of disease. In case tumor is not localized, medical therapy with Phosphorus and Calcitriol can be tried until surgery can be performed.

In conclusion, TIO should be included in the differential diagnosis of painful myopathy, as it is rewarding to the physician and gratifying to the patient. This communication in this journal on TIO may provide readers with an opportunity to refresh their knowledge about this rare entity.

Hanmayyagari Babul Reddy, Guntaka Mounika1, V. Sri Nagesh2, I. Satish Rao3
Consultant Endocrinologist, Krishna Institute of Medical Sciences, Secunderabad, Department of Biochemistry
1Prime Hospital, K.P.H.B, Kukatpally, Consultant Endocrinologist2, Care Hospital, Banjara Hills, Hyderabad, Andhra Pradesh, India Department of Pathology3, Krishna Institute of Medical Sciences, Secunderabad.

For correspondence:
Dr. Hanmayyagari Babulreddy, Flat No. A 904, Sri Sai Ram Towers, Beside Alwyn Colony, Water Tank, Hafeezpet, Hyderabad - 500 049, Andhra Pradesh, India.
E-mail: babulreddy78@gmail.com

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