

provide opportunities to enhance clinical reasoning and professional behaviours.³ Debates provide opportunities for participation, active learning, cooperative learning and development of critical thinking.³⁻⁵ We examined the feasibility of using debate as a part of a seminar to enhance learning for postgraduates.

Participants comprised 16 postgraduate psychiatry residents attending the debate on 'legalization of cannabis'. Two residents were assigned to prepare 'for' and 'against' the topic, and all others were randomly divided into either of the two groups. Five key learning points each were identified before the debate. All the participants received relevant study materials. Debate included short PowerPoint presentations of 10 minutes each (i.e. the affirmative), 'for' and 'against' the topic. Thereafter, comments were solicited from the team members. Any point raised by the participant from one group was followed by a rebuttal from the other group. The discussions were actively facilitated and moderated. Finally, all the learning points were summarized by the residents who made the presentations. Feedback was obtained from all the participants after the session.

On the day of the debate, 14/16 (88%) participants were present; of them, 6 (43%) were in the 'for' group and 8 (57%) in the 'against' group. All the participants returned the completed feedback forms. Of the 14 participants, 9 (64%) had read the study materials provided, and 6 (43%) had looked at other sources for additional information. All agreed that they learned from the session; the reasons cited were 'more interaction', 'less presentation, more discussion', 'learnt more information' and 'new concept, interesting'. All the participants reported this method of learning to be better than conventional seminars. The reasons cited included 'more preparation/self-reading', 'active participation', 'more opportunity for involvement' and 'different than usual/not monotonous'.

The positive aspects of this experience were stated as, 'everyone participated', 'interactive', 'more opportunity to participate' and 'different from regular academics'. The negative aspects reported were 'deviation from topic', 'chaos during arguments/everyone speaking at once' and 'presenting arguments without giving facts'. The overall experience was felt to be satisfactory by 11 (79%).

Although many researchers view debates as more adversarial than other teaching methods, we found the experience more satisfying. The majority (79%) of our participants found it to be satisfactory and better than usual seminars. Participating in a debate enhances learning, whereas observing a debate does not.⁶ In our debate, all the participants had the opportunity to put forth their points, thus ensuring active participation. Debates enhance active learning as they encourage listening, reflecting on what others say and speaking.³ This type of learning follows the principles of adult learning and was well appreciated than the conventional seminars, which have fewer opportunities for interaction. Furthermore, debates have been found to enhance critical thinking among the participants.^{3,4}

Three-fourths of the students read the specific reading material provided to them and two-fifths looked up additional reading materials. Thus, the debate also encouraged self-directed learning, which is a step forward to life-long learning. Handouts that highlight key learning points can be distributed during or immediately after the debate to aid learning.

We choose to debate on 'legalization of cannabis', which is a controversial topic with advocates for and against it.⁷⁻⁹ Several such topics have been used in 'Controversies in Psychiatry' debate seminars at Pittsburgh School of Medicine.¹⁰ The students are motivated to search the recent literature to understand the pros and cons of the topic. The presenters identified key learning points and ensured that these are understood by all the participants. Such practice of 'trainees as teachers' has been shown to enhance team-based learning and is considered an essential component of postgraduate curriculum.^{11,12}

However, the downside was some chaos and deviation from the topic when participants argued. Therefore, the moderator should be

mindful of unnecessary digressions from the topic by providing opportunities for everyone to participate and not letting a few to dominate the discussions. The topic for the debate should be carefully chosen as not all topics are suitable for debating. If there is some controversy around the topic, students are likely to actively participate as was seen in our case. Nevertheless, debates have been extended to several areas of learning, for example, what tests to order in case-based debates.¹³ Limitations of our study include a small sample, and that the learning method was tried only once.

Conflicts of interest. None declared

REFERENCES

- 1 Edwards R. *Competitive debate: The official guide*. New York: Penguin Group; 2008.
- 2 Merida D, Baratas I, Arrue M. Guided university debate (GUD): A new promising teaching and learning strategy for undergraduate nursing students. *Nurse Educ Today* 2016;**45**:69–71.
- 3 Darby M. Debate: A teaching-learning strategy for developing competence in communication and critical thinking. *J Dent Hyg* 2007;**81**:78.
- 4 Bell EA. Debate: A strategy for teaching critical thinking. *Nurse Educ* 1991;**16**:6–7.
- 5 Griswold LA. Debate as a teaching strategy. *Am J Occup Ther* 2000;**54**:427–8.
- 6 Lampkin SJ, Collins C, Danison R, Lewis M. Active learning through a debate series in a first-year pharmacy self-care course. *Am J Pharm Educ* 2015;**79**:25.
- 7 Wilkinson ST, Yarnell S, Radhakrishnan R, Ball SA, D'Souza DC. Marijuana legalization: Impact on physicians and public health. *Annu Rev Med* 2016;**67**:453–66.
- 8 Budney AJ, Borodovsky JT. The potential impact of cannabis legalization on the development of cannabis use disorders. *Prev Med* 2017;**104**:31–6.
- 9 Caulkins JP, Kilmer B. Considering marijuana legalization carefully: Insights for other jurisdictions from analysis for Vermont. *Addiction* 2016;**111**:2082–9.
- 10 Ganguli M, Rancurello M. Starting fights: The debate as teaching tool. *Acad Psychiatry* 1990;**14**:39–43.
- 11 Ravindranath D, Gay TL, Riba MB. Trainees as teachers in team-based learning. *Acad Psychiatry* 2010;**34**:294–7.
- 12 Crisp-Han H, Chambliss RB, Coverdale J. Teaching psychiatry residents to teach: A national survey. *Acad Psychiatry* 2013;**37**:23–6.
- 13 Jhaveri KD, Chawla A, Shah HH. Case-based debates: An innovative teaching tool in nephrology education. *Ren Fail* 2012;**34**:1043–5.

Samir Kumar Praharaj
Rajeshkrishna P. Bhandary
Department of Psychiatry
Kasturba Medical College, Manipal
Manipal Academy of Higher Education, Manipal, Karnataka, India
samirpsyche@yahoo.co.in

Sahithi Veeramreddy
Apollo Institute of Medical Sciences and Research
Chittoor, Andhra Pradesh, India

Swarna Buddha Nayok
National Institute of Mental Health and Neurosciences
Bengaluru, Karnataka, India

Tumour-induced osteomalacia due to thymolipoma

Tumour-induced osteomalacia (TIO) is a rare paraneoplastic syndrome due to secretion of fibroblast growth factor-23 (FGF-23) from tumours located in extremities or head and neck and rarely in the thorax.¹⁻⁴ We report a patient with TIO caused by a thymus tumour. The patient recovered following resection.

A 31-year-old woman presented with bilateral hip and thigh pain with difficulty in walking for the past 4 years. She was bedridden but did not suffer from any other systemic illness or fractures. Neurological

examination revealed grade 3 power in both hip joints without wasting and normal tendon reflexes. Other systemic examination was unremarkable. Local examination showed focal tenderness over bilateral hip joints and pain on passive movement.

Her investigations showed persistent normal serum calcium (9.43 mg/dl) with low serum phosphate levels (1.21 mg/dl) and raised serum alkaline phosphatase (192 U/L). Serum 25-hydroxy-vitamin D was 25 ng/ml, 1,25-dihydroxy-vitamin D level was 13.5 pg/ml and intact parathyroid hormone was 78.7 pg/ml. Radiological examination showed pseudofracture on the medial aspect of the proximal shaft of both femurs (Fig. 1a), and MRI of the hip revealed grade 2 avascular necrosis of bilateral femoral heads (Fig. 1b). A provisional diagnosis of hypophosphataemic rickets was made. Her mean urinary phosphorus was 0.43 g/24 hours and urinary creatinine was 0.99 g/24 hours with calculated fractional excretion of phosphorus (FePhosphorus) of 14.7%, tubular reabsorption of phosphorus (TRP) of 85.7% and $TmPO_4/GFR$ of 1.09, which confirmed renal phosphate wasting.

Her serum FGF-23 level was markedly high at 1880 RU/ml (normal 0–150 RU/ml). She underwent ^{18}F -fluorodeoxyglucose positron emission tomography (^{18}F -FDG PET)/CT scan, which revealed an ill-defined hypodense lesion measuring 19 mm×13 mm in the anterior mediastinum causing indentation on the sternum and great vessels (Figs 1c and d). The patient underwent video-assisted thoracoscopic resection of the thymic mass. Histopathology was suggestive of thymolipoma.

She recovered well and was discharged on postoperative day 7. After 15 days of surgery, the patient was evaluated for biochemical improvement. Her serum phosphates (4.5 mg/dl), serum alkaline phosphatase (94 U/L) and serum FGF-23 (125.2 RU/ml) normalized. Her FePhosphorus decreased to 5.95%, and TRP and $TmPO_4/GFR$ increased to 94.05% and 4.18, respectively. After 3 months, she was pain-free, was ambulant without support and was performing all household activities.

Localization of a tumour causing oncogenic osteomalacia is often difficult.² In our patient, ^{18}F -FDG PET/CT showed a lesion in the thymus, and histopathology confirmed it to be thymolipoma, which has also not been previously reported causing TIO to the best of our

knowledge. TIO is usually caused by mesenchymal tumours. The thymus contains cells of different lineages: epithelial cells, mesenchymal cells, endothelial cells and dendritic cells. Histologically, thymolipomas are encapsulated tumours composed of adipose cells and thymic tissue containing epithelial cells, immature lymphocytes and Hassall corpuscles. It is postulated that thymolipoma arises histogenetically from thymic fat and/or neoplastic thymic epithelial cells combined or replacing each other. Thymolipoma may be associated with autoimmune symptoms such as anaemia, hypogammaglobulinaemia, hyperthyroidism and, most frequently, myasthenia gravis.⁵ In view of the thymic lesion, the patient was evaluated for myasthenia gravis with repetitive nerve stimulation test, neostigmine test and anticholinesterase antibodies. All were negative.

There is no report of avascular necrosis of femoral head in TIO in the literature. She underwent laparoscopic thoracic exploration and removal of the tumour. This modality of treatment for TIO is possibly the first in the literature. Postoperatively, her symptoms improved dramatically and she became ambulant without support. Her biochemical profile showed normalization of serum phosphate and other related parameters including FGF-23. This indirectly provided evidence that the thymic tumour was the culprit. This could have been further supported by immunohistochemistry⁶ or reverse transcriptase-polymerase chain reaction;⁷ however, facilities for both were not available.

Conflicts of interest. None declared

Kamlesh Ahari
Neerja Vijayan
Department of Medicine

M.K. Garg
Department of Medicine and Endocrinology
mkgargs@gmail.com

Ravindra Shukla
Department of Endocrinology

Ramkaran Choudhary
Department of Surgery

All India Institute of Medical Sciences, Jodhpur, Rajasthan, India

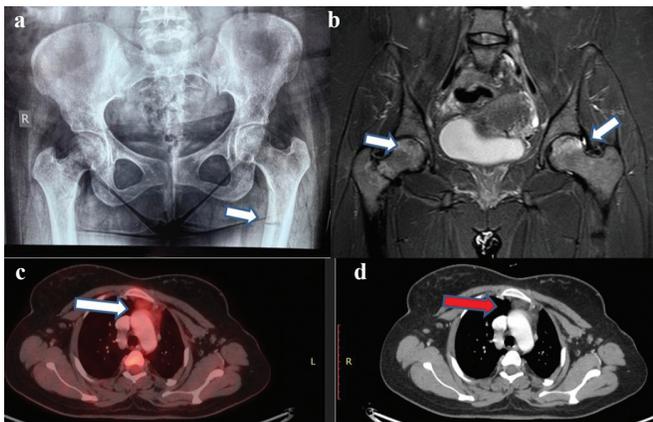


FIG 1. (a) X-ray hip revealing pseudofracture; (b) MRI scan showing avascular necrosis of the hip; (c) ^{18}F -fluorodeoxyglucose positron emission tomography; and (d) CT showing increased uptake and a lesion in the thymus

REFERENCES

- 1 Pal R, Bhadada SK, Shingare A, Bhansali A, Kamalanathan S, Chadha M, *et al.* Tumour-induced osteomalacia: Experience from three tertiary care centres in India. *Endocr Connect* 2019. pii: EC-18-0552.R1.
- 2 Shah R, Lila AR, Jadhav S, Patil VA, Mahajan A, Sonawane S, *et al.* Tumour induced osteomalacia in head and neck region: Single center experience and systematic review. *Endocr Connect* 2019. pii: EC-19-0341.
- 3 Zuo QY, Wang H, Li W, Niu XH, Huang YH, Chen J, *et al.* Treatment and outcomes of tumor-induced osteomalacia associated with phosphaturic mesenchymal tumors: Retrospective review of 12 patients. *BMC Musculoskelet Disord* 2017;**18**:403.
- 4 Kaniuka-Jakubowska S, Biernat W, Lewczuk A, Świątkowska-Stodulska R, Sworzczak K. Oncogenic osteomalacia should be considered in hypophosphatemia, bone pain and pathological fractures. *Endokrynol Pol* 2012;**63**:234–8.
- 5 den Bakker MA, Marx A, Mukai K, Ströbel P. Mesenchymal tumours of the mediastinum. Part I. *Virchows Arch* 2015;**467**:487–500.
- 6 Shiba E, Matsuyama A, Shibuya R, Yabuki K, Harada H, Nakamoto M, *et al.* Immunohistochemical and molecular detection of the expression of FGF23 in phosphaturic mesenchymal tumors including the non-phosphaturic variant. *Diagn Pathol* 2016;**11**:26.
- 7 Bahrami A, Weiss SW, Montgomery E, Horvai AE, Jin L, Inwards CY, *et al.* RT-PCR analysis for FGF23 using paraffin sections in the diagnosis of phosphaturic mesenchymal tumours with and without known tumour induced osteomalacia. *Am J Surg Pathol* 2009;**33**:1348–54.