PSG MediPulse

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Developing Clinical Nutrition Guidelines

by **Mrs. Kavitha Venugopal**, Chief Dietitian PSG Hospitals

NUTRITION SUPPORT TEAM

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A significant number of patients are still undernourished on admission to hospital, and some patients continue to lose weight during their hospital stay. Prevalence of malnutrition in hospitalized patients was reported to range from 20% to 50%.

Malnutrition is a significant but modifiable factor which affects complication rates, mortality, morbidity, hospital stay, cost and overall results of hospitalized patients in general and critically ill patients in particular. Nutritional science has become specialized, offering focused expert intervention to specific patient populations based on their illness and special requirements.

Nutritional support groups have been successfully functioning in hospitals across the developed world by combining the services of clinicians, nutritionist and specialized nurses with expertise in focused specialties, offering effective and specific nutritional interventions to malnourished patients and improving overall clinical results. They may work either independently or as part of a nutrition support team.

GOALS OF NST

- Preventing and treating Hospital malnutrition
- Reducing or avoiding metabolic complications
- Reducing complications related to nutrition
- Reducing mechanical complications
- Developing clinical nutrition guidelines
- Monitoring and evaluation of nutrition therapy
- Collecting data on the effectiveness (and side effects) of artificial nutrition
- Being a centre of knowledge
- Sharing knowledge with others

Being a tertiary care teaching hospital, we offer the advantage of Nutritional support groups to our patients, co-ordinated by the Department of Clinical Nutrition. We would be one of the very few hospitals offering holistic nutritional care and be a leader and centre of excellence as PSG Hospitals started the first NST in teaching hospitals in India.

Department of Clinical Nutrition will be an allied department of Dietary department, headed by Dr.K.Balu, Surgical Gastroenterologist, Medical Superintendent, PSG SSH and co-headed by Mrs.V.Kavitha, Chief Dietitian. It will serve to co-ordinate the training, interaction and management of malnutrition in patients by team of Nutritionist, Doctors, Nurses and other healthcare members with expertise in specific domain.

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Management of G C T : A New Perspective

by **Dr. Major K. Kamalnathan** MBBS,
MS Gen Surgery, D, Ortho DNB, Ortho MNAMS (Ortho)

1. CASE REPORT

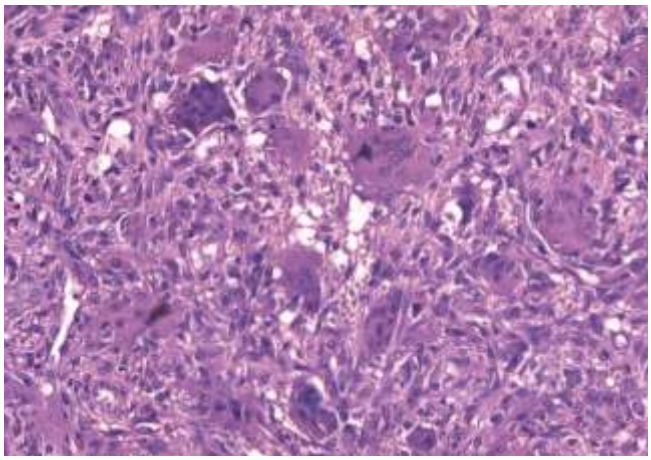
A patient 23 year old female.

- Complaints of pain over right distal thigh x 3 months increased for past 1 month following h/o trivial trauma, insidious in onset, progressive, aggravated on weight bearing and relieved on rest and medication
- Associated with swelling over lower thigh x 2 months insidious in onset, gradually progressive to attain present size
- No h/o fever/evening rise of temp/LOW/LOA
- Antalgic gait
- Muscle wasting at right thigh
- 15x4cm diffuse swlling in suprapatellar region, smooth surface, ill defined margin
- No warmth
- Tenderness at lateral aspect of distal thigh 17x6cm swelling, globular in shape extending above patella , smooth surface ill defined margin , not reducible, firm to cystic in consistency
- Synovial thickening(+)
- Bony irregularity (+)
- No fixed deformity
- Rom 0-90' – painful and restricted

2. PROVISIONAL DIAGNOSIS – GCT

3. MRI REPORT

- Large expansile, eccentric, subarticular, lytic – soft tissue lesion in the distal end of femur, involving the lateral femur condyle
- No significant matrix mineralization
- Cortical break in anterolateral aspect with extra-osseous protrusion of the mass mainly involving the lateral facet of trochlea and adjoining anterior non weight bearing part of articular surface of lateral femoral condyle



4. MICROSCOPIC APPEARANCE

A, B. Section shows multiple fragments of neoplasm composed of two population of cells - multi nucleated giant cells and spindle shaped cells. The giant cells have abundant amount of eosinophilic cytoplasm, 50-60 vesicular nuclei with mild nuclear pleomorphism and a few showing prominent nucleopli. There is no mitotic activity. The thin stroma in between the giant cells contain oval to spindle cells with similar nuclear morphology as that of multi nucleated cells. Areas of hemorrhage, many congested and fibrin thrombi containing blood vessels, scattered hemosiderin pigments and mild chronic inflammation are also noted.

5. DIAGNOSIS

RIGHT DISTAL FEMUR SWELLING, INCISIONAL BIOPSY:- FEATURES ARE CONSISTENT WITH GIANT CELL TUMOUR OF BONE (OSTEOCLASTOMA).

6. DIAGNOSED AS GCT OF LATERAL CONDYLE OF RIGHT FEMUR

ENNEKING STAGE 2B

CAMPANACCI GRADE 3

7. TREATMENT OPTIONS

- **INTRA LESIONAL EXTENDED CURRETAGE WITH**
  - AUTOGRAFT
  - ALLOGRAFT
  - BONE GRAFT SUBSTITUTE
  - PMMA BONE CEMENT

- **WIDE RESSECTION AND SUBSIQUENT** RECONSTRUCTION WITH CUSTOM MADE MEGA PROSTHESIS - > 2/3 BONE INVOLVEMENT

8. WE HAD GONE WITH

Intralesional extended curretage with High Speed Burr, Hydrogen Peroxide, Electrocautery and Sandwich Techique with Cannulated Cancellous Screw Augumentation

INTRAOP C-ARM IMAGE

POST OP IMAGE

9. RECURRENCE RATE

PROCEDURE	RECURRENCE
Without local adjuvants	20%
With intralesional curettage and bone grafting alone	45%
Adjuvants such as liquid nitrogen, phenol, hydrogen peroxide, and bone cement	17%
Extended curettage with a high-speed burr only, no adjuvant treatment, and allograft packing	12%
ECryosurgery	8%

10. BONE GRAFTING

- Autograft is to be harvested from another site - separate gloves and instruments to avoid cross contamination
- Theoretical advantage of restoring normal biomechanics to the joint surface to prevent future degenerative joint disease and restoring bone stock - help if future procedures are necessary

11. DISADVANTAGES

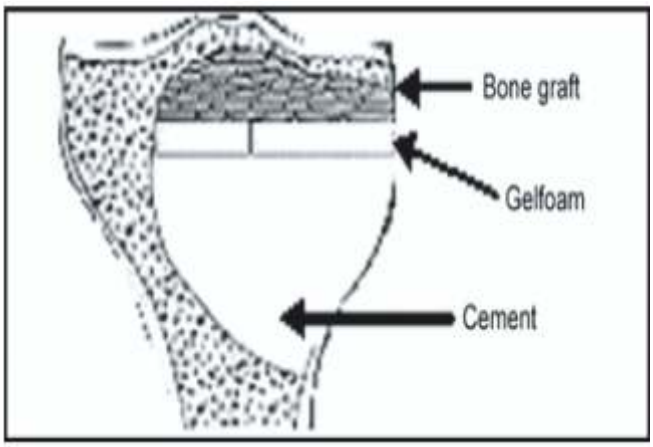
- The joint must be protected for an extended time to prevent a pathologic fracture
- Tumor recurrence often is difficult or impossible to distinguish from graft resorption

12. BONE CEMENT

Advantages

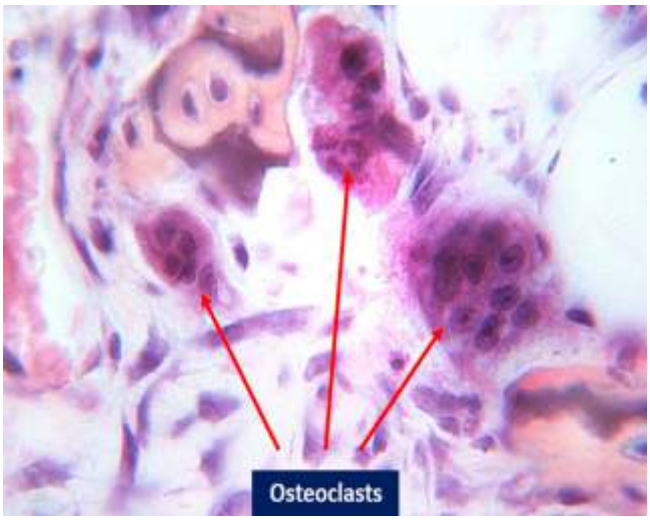
- Ease of application
- Immediate structural support
- Ease with which local recurrence can be detected adjacent to the cement mantle
- Screws placed in a crossed or divergent pattern are used to augment the cement mantle.
- Biomechanical studies performed have shown this method to significantly increase the strength of the reconstruction

Subarticular lesions where the amount of residual subchondral bone after an extended curettage is less than 1 cm



13. BISPHOSPHONATES

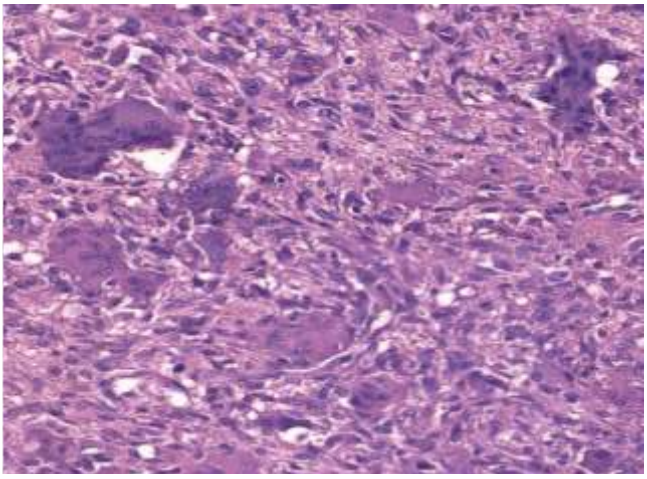
- Inhibit osteoclastic activity and promote osteoclast apoptosis
- Systemic zoledronic acid in inoperable tumors - stabilization of both local and metastatic disease
- Surgical adjuvant or as an option in unresectable tumors
- Anti-osteoclastic agent in the management of osteolytic bone metastases is well accepted. Furthermore in vitro studies have shown that bisphosphonates also induce apoptosis in GCT stromal cells
- The effect of reduction of local recurrence was significant in patients with stage III diseases. Patients treated with bisphosphonate did not report any untoward effects
- Clinical use of bisphosphonates as an adjuvant therapy for giant cell tumor of bone demonstrated a lower local recurrence rate



14. CURRENT CONCEPTS IN THE TREATMENT OF GIANT CELL TUMOUR OF BONE

15. DENOSUMAB

- Human monoclonal antibody that inhibits normal and tumor associated bone lysis by limiting osteoclastic maturation (i.E., Prevents activation of receptor activator of nuclear factor kb [RANK]
- Early results are promising - radiographic studies showing sclerosis and reconstitution of cortical bone with a subsequent decrease in clinical symptoms
- Giant-cell tumor of bone (GCTB) is a locally aggressive, benign osteolytic tumor in which bone destruction is mediated by RANK ligand (RANKL)
- Subcutaneous denosumab 120 mg every 4 week
- Efficacy endpoint was the proportion of patients who had a 90% or more elimination of giant cells from their tumor
- Denosumab also reduced the relative content of proliferative, densely cellular tumor stromal cells, replacing them with nonproliferative, differentiated, densely woven new bone.
- Denosumab continues to be studied as a potential treatment for GCT
- Bisphosphonates were successful in controlling tumour growth and a higher apoptotic index of tumour cells was seen after zoledronic acid versus controls
- Denosumab remains a highly effective treatment option for patients with advanced GCTB.
- A short duration of 2–4 months neoadjuvant denosumab is advised to facilitate less morbid surgery and prevent incomplete curettage by macroscopic tumour alterations impossible to distinguish from graft resorption



16. CONCLUSION

- GCT of bone is an intermediate, locally aggressive but rarely metastasizing tumour.
- Treatment decision are made by multi-disciplinary team.
- Ideally all the patients should be treated with intralesional extended curettage with local adjuvant treatment with phenol/liquid nitrogen / PMMA and thereby achieving joint salvage and optimal functional outcome.

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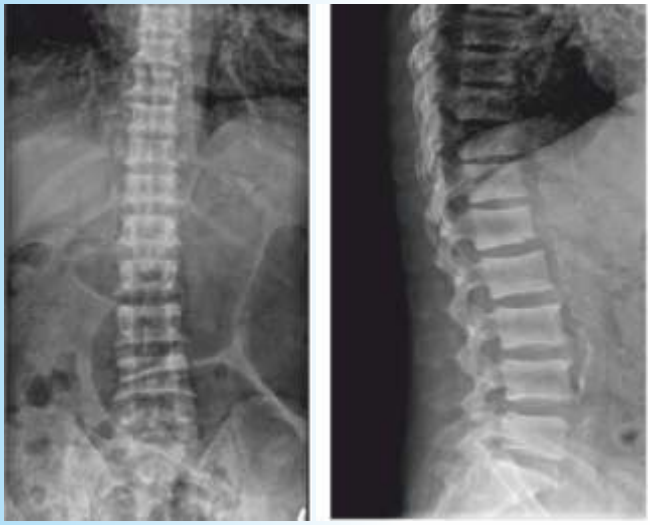
RUGGER JERSEY SPINE in a diabetic end stage kidney disease patient on long term hemodialysis- A case report

By **Dr. G. Venu** MD, DM Prof and Head of Department, Nephrology

1. INTRODUCTION

The "Rugger Jersey" spine sign is almost diagnostic of osteosclerosis associated with secondary hyperparathyroidism (1,3). But now-a-days this sign is less prevalent due to timely intervention with various treatment modalities like dialysis and kidney transplantation along with effective medications to control phosphorus and parathormone levels. However few cases were reported in patients who were not complying with medications and dialysis (1). We report a case of an elderly diabetic end stage kidney disease patient with Rugger Jersey spine sign who was on maintenance hemodialysis for ten years.



2. CASE REPORT

A 67 years old gentleman is a known case of Type - II Diabetes mellitus for 38 years, Systemic hypertension for 30 years and chronic kidney disease on maintenance hemodialysis for 10 years.

His initial bone profile done in August 2007 showed Calcium -6.0 mg/dL, phosphorous - 5.4mg/dL, ALP – 107 units/ L , PTH- 196 pg/ml, Vitamin D- 36.99 ng/mL. Patient was on regular follow up and was on calcium supplements and phosphate binders along with diet restriction. His bone profile was reasonably stable for a period of seven years.Around 2014, his bone profile showed Calcium- 9.3 mg/dL, phosphorous- 5.3mg/dL, ALP -140 units/ L, PTH- 645.5 pg/ml, Vitamin D- 39.58 ng/ml. We stepped- up phosphate binders and started him on Cinacalcet. He was also advised Endocrinologist opinion. But patient neither came for follow up nor took his medications regularly other than his regular dialysis sessions due to financial constraints and personal reasons. His bone profile gradually worsened over a period of three years.

Patient's serial bone profile

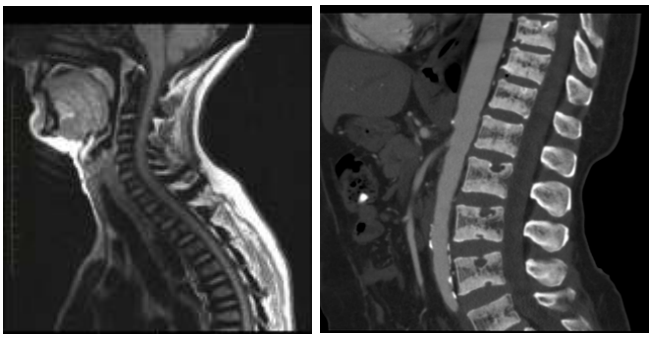
Year	Calcium mg/dL	Phosphorus mg/dL	ALP Units/ L	PTH pg/mL	Vitamin D ng/mL
2007	6.0	5.4	107	196	36.99
2008	8.9	5.4	140	-	-
2009	8.3	5.13	86	-	-
2010	9.24	6.0	105	-	-
2011	9.5	6.4	91	42	36.51
2012	8.8	5.8	102	319	-
2013	9.8	4.3	116	245	-
2014	9.3	5.3	140	645.5	39.58
2015	-	-	-	-	-
2016	-	-	-	-	-
2017	9.4	6.2	426	1170	40.52

After three years, in 2017, he complained of severe back pain and was admitted. His Bone profile showedCalcium - 9.4 mg/dL, phosphorous 6.2mg/dL, ALP -426units/L, PTH - 1170 pg/ml, and Vitamin D- 40.52 ng/ml. X- Ray Lumbosacral spine showed opaque sclerotic bands in the superior and inferior endplates of lumbar vertebral bodies giving Rugger- jersey spine appearance (Figure-1). Patient expired a few months later due to acute coronary event.

3. DISCUSSION

Patients on long term hemodialysis develop complicated bone disorders collectively termed as renal osteodystrophy. This includes a spectrum of bone disorders such as high turnover osteodystrophy caused due to secondary hyperparathyroidism, mixed uremic osteodystrophy, low turnover osteomalacia and adynamic bone disease(2).

In a study conducted by Lacativa et al. though subperiosteal bone resorption was found in 94% of patients, Rugger Jersey spine sign was prevalent only in 27% of patients with secondary hyperparathyroidism (2). In a study done in our institution regarding the prevalence of bone mineral disorder in chronic kidney disease patients on hemodialysis, we found twelve patients with secondary hyperparathyroidism above the recommended target levelas per KDIGO guidelines among 110 patients, when admitted with severe renal failure. The median duration of CKD in these patients was 39 months. After hemodialysis initiation three patients were found to have persistent hyperparathyroidism after a median duration of 10 years on hemodialysis. X- ray lumbosacral spine showing Rugger jersey spine sign was found only in one patient indicating the low prevalence in our dialysis unit.



Rugger jersey spine is seen in secondary hyperparathyroidism associated with chronic kidney disease. It is due to osteosclerosis affecting the axial skeleton such as pelvis, ribs and spine. Osteoclasts stimulated by parathormone causes increased bone resorption to maintain serum calcium levels. As a result, osteoblasts produce excess osteoid which is devoid of hydroxyapatite. This difference in the density of osteoid and normal mineralized bone result in alternating parallel bands of opaque and translucent shadows, giving a typical Rugger Jersey spine appearance(3).

The radiological differential diagnosis is the sandwich vertebrae seen in osteopetrosis, an inherited disease causing dysfunctional bone remodeling. The demarcation between the opaque endplates and the central lucent area is distinct in osteopetrosis unlike osteosclerosis due to hyperparathyroidism. Another differential diagnosis is the 'picture frame 'vertebral body seen in Paget's disease where the cortex of the vertebral body is thickened on all sides (1,3).

4. CONFLICTS OF INTEREST STATEMENT

None declared

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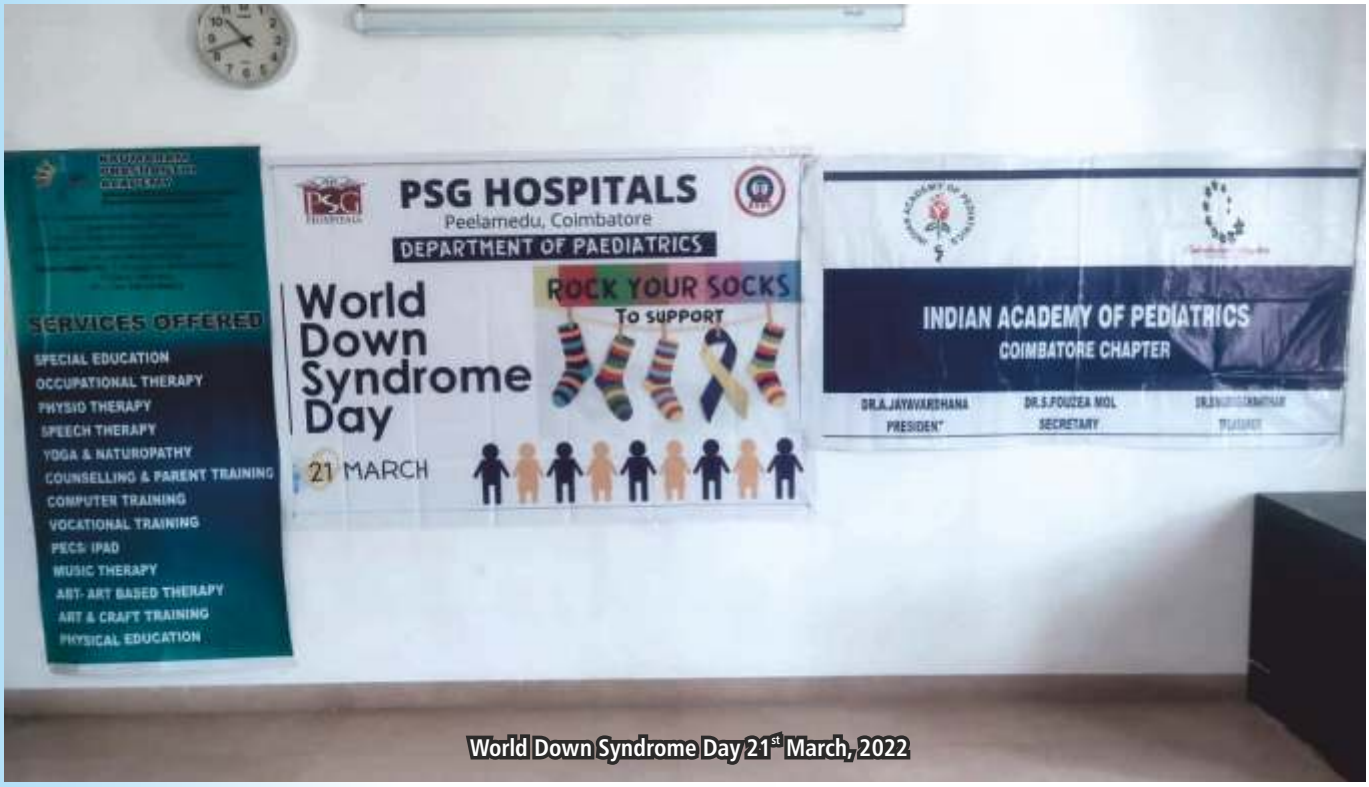
2. **Lacativa PG, Franco FM, Pimentel JR, Patricio Filho PJ, Goncalves MD, Farias ML (2009) Prevalence of Radiological findings among cases of severe secondary Hyperparathyroidism. Sao Paulo Med J 127(2):71–77**
3. **Kevin J Martin, Jurgen Floege, Markus Ketteler, Bone and Mineral Metabolism in Chronic Kidney Disease, Comprehensive Clinical Nephrology, Chapter 85, 984-999**
4. **Aaron Wittenberg, The Rugger-jersey Spine sign, Radiology2004230:2, 491-492**

Social Activities

Blood Donation Drive at Sandfits

Women's day celebration 8th March, 2022



World Down Syndrome Day 21st March, 2022


Paediatric Camp 21st March, 2022


Geriatric Camp at Santhi Ashram Kovaipudur

For more details:

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