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Focus-
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MESSAGE

Dr. SANJAY WADHWA
President

Indian Association of
Physical Medicine and Rehabilitation
Professor, Dept. of Physical Medicine &
Rehabilitation, AIIMS, New Delhi - 110029
E-mails: iapmrpresident@gmail.com
wadhwadr@gmail.com

I am very glad to know that the Kerala Chapter of the Indian Association of Physical Medicine and Rehabilitation has planned to bring out the Kerala Journal of PMR on the occasion of the 48th National Conference of Indian Association of Physical Medicine and Rehabilitation which is being organised at Hotel Raviz Kadavu, Kozhikode, Kerala on 17 – 19 January 2020.

Kerala has always been at the forefront of growth and development of Physical Medicine and Rehabilitation in the country. It has produced a large number of Physiatrists which are spread out throughout the State as well as in the rest of the country and abroad. I have always enjoyed my interactions with very eminent Physiatrists from Kerala such as Professors PBM Menon, S Hariharan, KK Menon, George Joseph etc.

I have been informed by the Editor that this Journal will have different Sections, and these Sections will contain a number of articles showcasing Recent Advances, Current Scenarios, Expert Opinions, Case Reports, events related to the International Day of Persons with Disabilities, and Quiz etc.

I heartily congratulate and sincerely thank the Editor and the Editorial Team of this Kerala Journal of PMR for working very hard during the past few months. I have no doubt that this Journal will prove to be very useful as an important platform for sharing of scientific research and development in the field of PMR.

I look forward to receive a copy of this Journal soon. I, as President of IAPMR, am very glad to extend my whole hearted support to this Journal and wish this Journal great success.

SANJAY WADHWA

MESSAGE

Dr. MURALIDHARAN PC
President Kerala Chapter of IAMPR
Associate Professor
Department of PMR , Kottayam

Physiatry has evolved into a new generation speciality with the development of interventional physiatry, robotics, modern prosthetics and orthotics and protocols of acute rehabilitation. Evidence based practices and research advances will play a decisive role in decision making and development of therapeutic strategies. The Kerala chapter of IAPMR has taken strides in this area by motivating the young generation Physiatrists to stroll into the newer vistas. The recent continuing medical education programs organised by the chapter throws light on this .

We have senior physiatrists with vast experience and their willingness to share their experiences are amply demonstrated by their participation in the CME programs and conferences. The younger generation Physiatrists are expected to be more enthusiastic and their professional acumen need to be sharpened time and again.

We have conducted workshops to develop projects, research methodologies interventional procedures, biologicals in rheumatological disorders etc which were well accepted by our members. Future promises giant leaps for the speciality. A majority of medical colleges have PMR department and a significant number of private hospitals have started the same. The opportunities for Physiatrists are increasing with the advent of newer technologies and concepts.

It is time for sharing information, ideas, research outcomes and innovative practices. Our visionaries promulgated this proposal of an online journal and thought it fit to launch ithe same during the IAPMRCON2020. With the support of our members efforts bore fruit.

I take this opportunity to congratulate Dr Ravisankaran who almost single handedly fashioned this journal and made it a reality. My thanks to all members who have contributed to this effort in their own unique ways. Our Secretary Dr Selvan deserves special mention for his sincere and wholehearted dedication in all our activities.

MESSAGE

Dr. SELVAN.P

Kerala Chapter of Indian Association of Physical Medicine and Rehabilitation
Secretary

It gives me immense pleasure that our association journal KJPMR is getting published again. We have an excellent team of publishing desk. I am sure that under the leadership of the editor Dr. Ravi Sankaran, we will get regular issues of our journal, and also hoping in the future, it will be indexed.

Dr. RAVI SANKARAN
Associate Professor
Amrita Institute of Medical Sciences

FROM THE EDITOR'S DESK

The vision of this journal to make better tomorrow's Physiatrists. This will function as a Bulletin with limited peer review. The subsections are in concordance with the new MCI AETCOM module for MBBS. If we are to guide we must practice these qualities ourselves. All readers are invited to contribute. One only need read the guidelines section to see how.

With progression through future issues various optional submission styles will be introduced. This release adds the 'Cold Call', and 'Research is fun' sections. Based on need and response more may emerge. I would encourage all the readers to collect data according to the challenge protocol (see 'Research is fun' section) and share their findings.

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CONTENT

Avascular Necrosis of Talus in traditional coconut tree climbers: a case study

Author

Dr. Sudheera V.T.

Consultant Physiatrist

Department of Physical Medicine and Rehabilitation

Malabar Medical College Hospital and Research Center, Modakkallur Kozhikode

Dr. Sachin. A

****Intern***

Malabar Medical College Hospital and Research Center, Modakkallur Kozhikode

ABSTRACT

Coconut tree climbers are capable of extreme dorsiflexion, inversion and plantar flexion. They use a loop of coir at the ankle for support. Complex movements of foot are used by climbers while ascending and descending. Talus, the second largest tarsal bone has 60% of surface area covered by articular cartilage. Only limited area of penetrable bone is available for vascular perforation so it is predisposed to avascular necrosis which will lead to collapse of talus, which in turn lead to inability to bear weight. We present the case of a 53 year old male coconut tree climber who presented with inability to climb trees He was diagnosed with avascular necrosis of left talus, with the aid of radiological imaging. He was managed conservatively with analgesics, joint immobilization and occupational rehabilitation.

Keywords: coconut tree climber, Avascular necrosis, Talus, Occupational rehabilitation.

INTRODUCTION

Arboreal primates safely and effectively climb trees as they are capable of extreme dorsiflexion at ankle and inversion at subtalar joints. The human foot cannot undergo such deformation and it is not significant for their locomotor habits. A coconut tree climber who climbs more than 30 trees a day is capable of extreme dorsiflexion, inversion and plantar flexion similar to arboreal primates. This is because after long years of climbing, they acquire skeletal adaptations of the foot similar to tree climbing animals. And this causes the severe injury to the foot in traditional coconut tree climbers. They use a loop of coir at the ankle for support. Complex movements of foot which are used by climbers while ascending and descending are Plantarflexion and Dorsiflexion at ankle joint, Inversion at Subtalar joint, Flexion of metatarsophalangeal joints and interphalangeal joints. Climbing induces tremendous strain on the ankle, subtalar and inter tarsal joints. The hip and knee joints are alsoputunder great stress. A traditional coconut tree climber start his job usually in late teens or early twenties, and work to an age they could continue their job. This study provides preliminary data about the altered biomechanics used by tree climbers and the hazards following it.

CASE PRESENTATION:

A 53 year old male came with complaints of severe pain in both ankle joints for the past 5 days and difficulty to climb trees. He used to climb 25-30 trees a day. He had mild pain in both ankles for which he consulted orthopedician few years back and he was advised to stop climbing but pain had subsided with analgesics. His father was a traditional coconut tree climber and had pain and swelling of both ankle joints which worsened and he had to quit his job. No history of injury or any other systemic illness. Not an alcoholic or smoker. No other known comorbidities. On examination, full range of movements of both joints were painfully restricted. Swelling and tenderness was more on left ankle joint. There was no joint instability. Peripheral pulses were felt normally. Sensations were normal on both feet. X-rays (Figure 1 &2) showed progressive severe arthritic changes with sclerosis of Talus.

Figure1: X-Ray left ankle AP and Lateral views dated 30-01-2015

Figure 2: X-Ray Left ankle AP and Lateral views dated 10-06-2016

Figure 3: MRI Scan of left ankle joint showing avascular necrosis of talus with secondary osteoarthritic changes of tibiotalar joint

DISCUSSION

Human foot is designed to bear weight and aid bipedal locomotion. The ligaments, joints, bones, muscles and soft tissues make man alone among the mammalian cousins to have mastered the art

of walking on hind limbs. Arboreal existence to terrestrial living is responsible for anatomical changes seen in distal segments in upper and lower limbs. Gripping the tree trunk with fully inverted feet which bears the body weight, demands tremendous stress and strain of foot.

Late Mr. M.J Joseph alias Appachan, a farmer and a school dropout, foresaw this problem and developed a device which revolutionized the art of traditional coconut tree climbing.

This device has been largely accepted in North and South America, Maldives, Brazil, Mexico where coconut trees are found abundantly.

PATHOPHYSIOLOGY

Talus is the second largest tarsal bone and has 60% of its surface area covered by articular cartilage. There are no muscular or tendinous attachments. Only limited area of penetrable bone is available for vascular perforation. So it is predisposed to avascular necrosis. Osteonecrosis occurs mainly following Talar neck fractures or it can be due to atraumatic reasons. Regardless of cause, underlying mechanism is interruption in vascular supply leading to ischemic death of bone. Compression and trauma to the vessels maybe the cause in the above case study.

ASSOCIATIONS

The coconut tree climbers were observed with the following deformities in the foot plantar flexed first ray, Abducted hallux, Hammer toe, Hallux valgus, Varus foot with medially deviated toe, Cavus foot, Callous formation in the plantar and dorsal aspect of foot, Avascular necrosis of talus is rarely reported.

MANAGEMENT

Occupational rehabilitation according to individual's functional and cognitive capabilities should be given. When detected early, the ankle joint is protected from weight bearing by walking aids like a PTB orthosis then wait for revascularization. When detection is late, surgical management is preferred. 1) Arthrodesis of ankle, which is a salvage procedure. Pain is relieved and the alignment is maintained, but the movements of the joint have to be sacrificed and the patient will have an abnormal gait. 2) Vascularized bone grafting, 3) Total talar replacement, 4) Core compression.

CONCLUSION

Although avascular necrosis of talus is rare in coconut tree climbers, screening of suspected cases with imaging helps in early detection and conservative line of management. If left

unattended, it may lead to collapse of talus resulting in joint instability, inability to bear weight which may require surgical intervention. This may lead to abnormal gait and requiring the use of walking aid.

REFERENCES

1. Penny JN, Davis LA. Fractures and fracture-dislocations of neck of talus. J Trauma. 1980; 20:1029-37.(Pubmed)
2. Canale ST. Kelly FB, Jr Fractures of the neck of talus. Long term evaluation of seventy-one cases. J Bone Joint Surg Am. 1970;60:143-56. (Pubmed)
3. Hawkins LG. Fractures of the neck of talus. J Bone Joint Surg AM.1970;52:991-1002. (Pubmed)
4. Trauth J. Blasius K. Talus necrosis and its treatment. Aktuelle Traumatol.199;18:152-6. (Pubmed)
5. Mindell ER, Cisek EE, Kartalian G, Dziod JM. Late results of injuries to the talus. Analysis of forty cases. J Bone Joint Surg Am.1963;45:221-54. (Pubmed)
6. Canale ST. Fractures of the neck of talus. Orthopedics. 1990;13:1105-15. (Pubmed)
7. Zhai L, Sun N, Zhang BQ, Wang JG, Xing GY. Effect of liqiud-electric extracorporeal shock waves on treating traumatic avascular necrosis of talus. J Clin Rehab Tissue Eng Res.2010;14:3135-8. (Pubmed)
8. Freud KG. Complicated fractures of the neck of talus. Foot Ankle. 1988;8:203-7. (Pubmed)

Extraskeletal para-articular osteochondroma of Hoffa's fat pad - A case report

Dr. Unnikrishnan Ramachandran DPMR, DNB, D Med Rehab (Lon),
Dr.Vidya.G MD (PMR)

Centre for Rehabilitation and Pain relief, Saraswathy hospital, Parassala / Kumarapuram, Trivandrum, Kerala.

ABSTRACT

Introduction: Extraskeletal para-articular osteochondromas are rare benign intracapsular tumors. They occur due to osteocartilaginous metaplasia in the para-articular soft tissue in the elderly. We report the same in the knee in a young patient, arising from the Hoffa's fat pad.

Case report: A 26 year old male presented with a gradually enlarging anterior left knee swelling of three years duration and inability to flex the knee fully. Clinical and radiological evaluation detected an ossified mass in the Hoffa's fat pad with features of osteochondroma. He underwent excision of the mass and histopathology confirmed the diagnosis of extraskeletal para-articular osteochondroma. He was asymptomatic with functional improvement at 5 months follow up.

Conclusion: Extraskeletal para-articular osteochondromas are slow growing, benign extrasynovial tumours arising in soft tissues with rare occurrence. They can present even in young and can only be diagnosed with high index of suspicion, radiological features and clinicopathological correlation. They have to be distinguished from synovial chondromatosis and chondrosarcoma. It can be treated by surgical excision without any recurrence. If left untreated may lead to patellar tendinopathy and functional limitations.

Key words: Extraskeletal osteochondroma, hoffa's fat pad, osteocartilaginous metaplasia, knee swelling.

INTRODUCTION

Osteochondroma is the most common benign bone tumor and forms 10% to 15% of all bone tumors1. It often presents as solitary lesion, in the metaphyseal region and grows away from the joints2. However there exists a rare entity called extraskeletal para-articular osteochondroma. These osteocartilaginous tumors arise in the soft tissues adjacent to the joint without any bony or joint continuity3. They are more common in elderly patients4. Here we report the case of a 26 year old male who presented to our centre with a history of left knee swelling of 3 years duration. Diagnostic imaging revealed a calcified mass in the Hoffa's fat pad of the knee. Diagnostic clinical and radiological features of this unusual tumor are presented and literature reviewed.

CASE REPORT

A 26 year-old male graduate with sedentary habits presented with a three year history of left knee swelling. Until 4 months ago he ignored it, but then noticed that it was gradually enlarging in size and that he could not squat completely. He also noted occasional episodes of pain in left knee on doing exercise. There was no history of weight loss or night pain or pain in other joints. There was no history of trauma. There was no significant past medical or surgical history. No family history of similar illness noted. There was no prior treatment history other than occasional intake of NSAIDs for knee pain. Physical examination of left knee revealed restricted range of motion of 0-100 degrees and a 7x6 cm swelling in the anteromedial aspect of the knee joint, extending slightly above and predominantly below the joint line (Fig.1). On palpation, it was hard in consistency with a smooth surface. The patella was felt moving with the mass with some restriction in mediolateral mobility. The swelling was non tender with skin over the swelling being normal. There was no joint effusion or signs of instability. Quadriceps was deconditioned on the left side.

On evaluation, his blood routine was normal. Radiographs of the left knee revealed a well defined calcified ovoid lesion in Hoffa's fat pad (Fig.2). CT imaging was done which showed an extraskeletal para articular osteochondroma arising from the Hoffa's fat pad extending up and medial to the patellar margin (Fig.3). Magnetic resonance imaging (MRI) of the left knee showed a densely calcified lesion measuring 5.9x 4.0x 6.2cm, in the Hoffa's fat pad with a peripheral hypointense soft tissue component (Fig.4). The articular cartilage did not reveal any evidence of erosion. Imaging features were suggestive of Hoffa's fat pad osteochondroma.

Fig.1. replace the highlighted part with 'on inspection, a mass is noted below the patella'

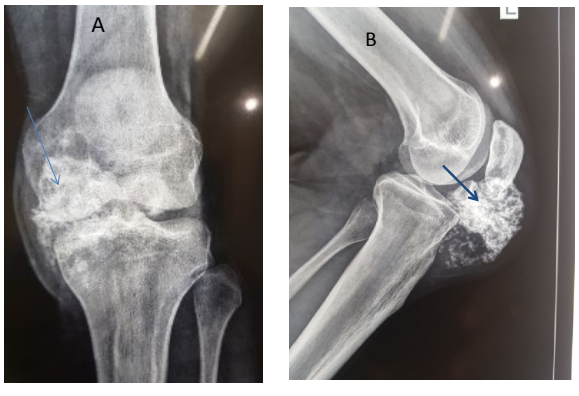


Fig 2. A,B- Anteroposterior and Lateral radiographs of left knee in a 26 yr old male showing a well defined calcified ovoid lesion in Hoffa's fat pad (arrows)

Fig. 2C Skyline view radiograph showing a mass medial to patella displacing the patella laterally.

Patient underwent excision of the tumour mass, which was separate from the patella and in the Hoffa's fat pad. Specimen was sent for histopathology. Gross examination revealed an unoriented nodular tissue. The largest nodule was 8x 7x 1 cm and hard in consistency. Cut

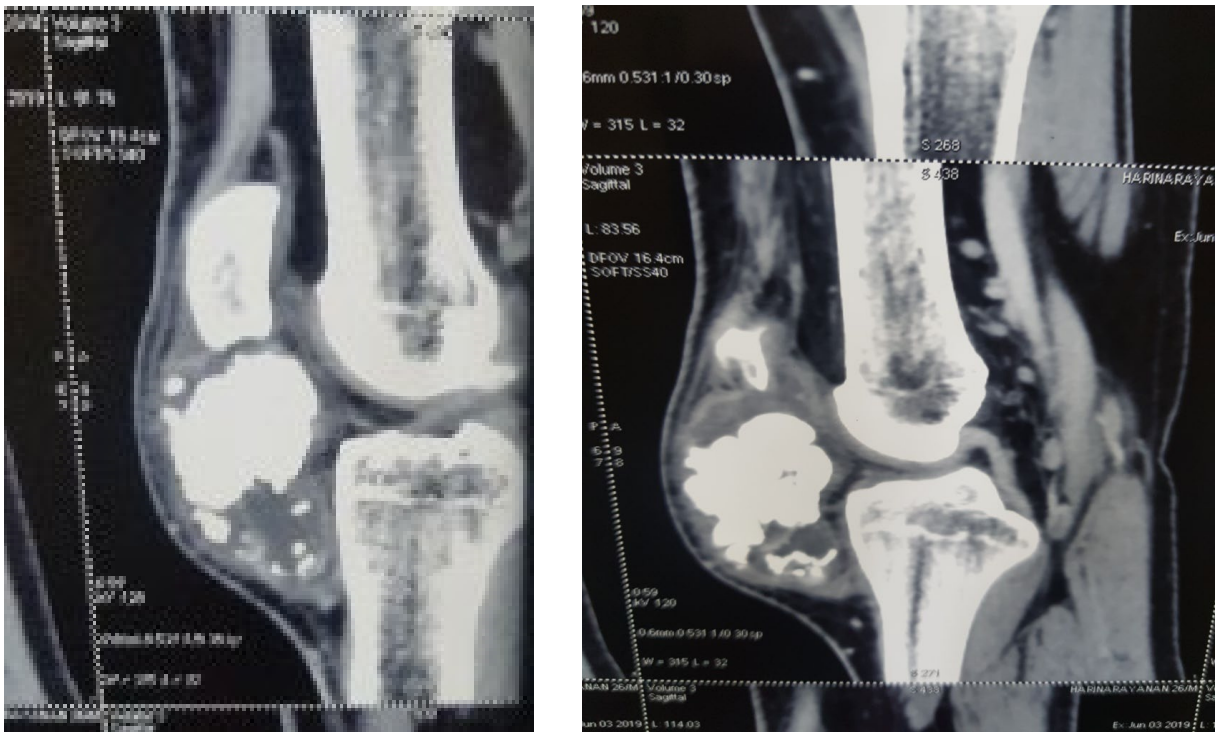


Fig 3. Saggital CT image of left knee showing an extraskeletal para articular osteochondroma arising from the Hoffa's fat pad

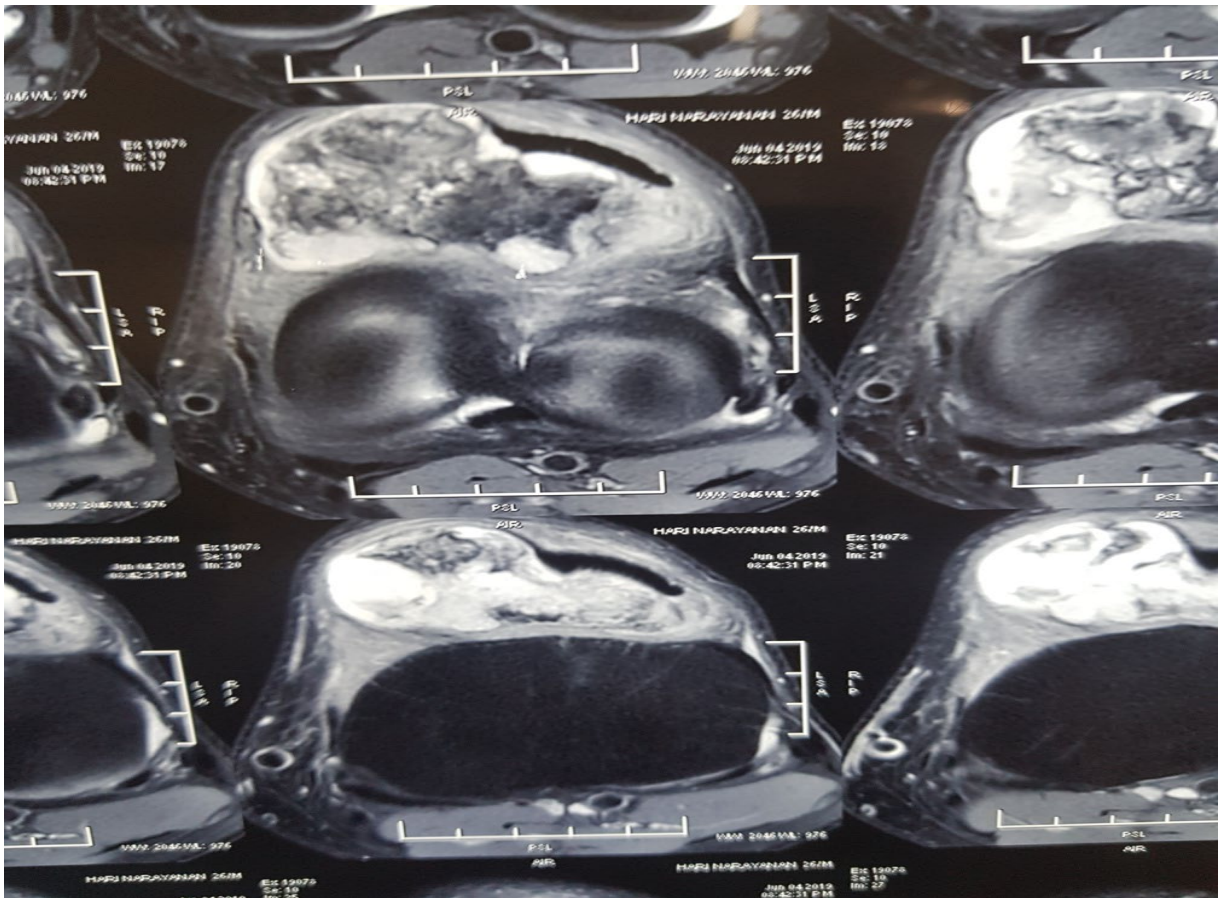
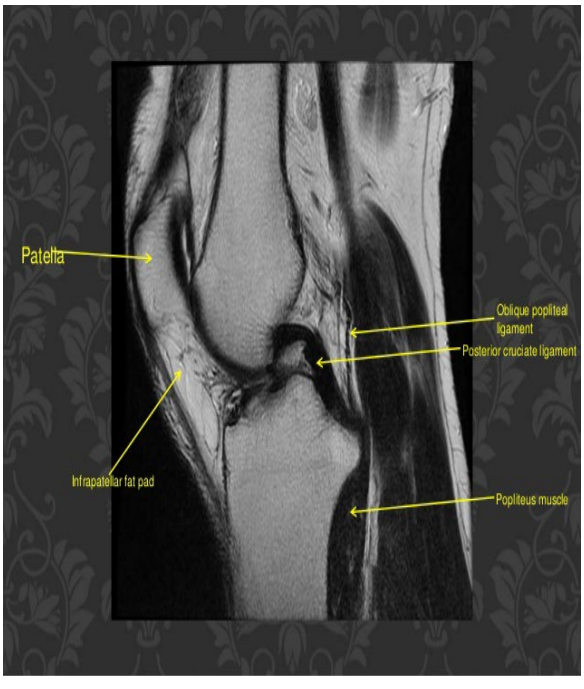


Fig.4 Axial T2 weighted MRI sequence showing a densely calcified lesion measuring 5.9x 4.0x 6.2 cm, in the Hoffa's fat pad with peripheral soft tissue component. Articular cartilage did not reveal any evidence of erosion



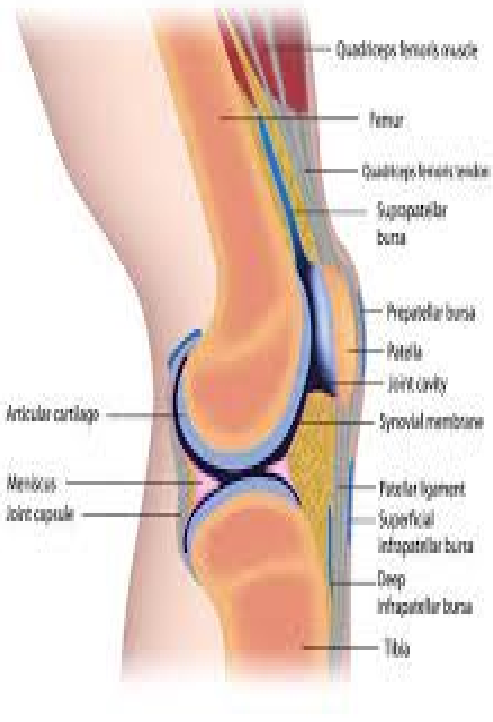


Fig 5 Normal appearance of Hoffa's fat pad in sagital MRI image

surface of the largest nodule showed a central bony tissue, surrounded by a cartilaginous cap. Maximum thickness of the cap was around 1.7 cm. Microscopy showed a bony core formed of trabeculae of lamellar bone separated from each other by fatty tissue. The bony core was surrounded by a cartilaginous cap composed of hyaline cartilage. No cytological atypia was noted. The pathological features were diagnostic of extraskeletal para-articular osteochondroma of Hoffa's fat pad. Postoperatively, at 5 months follow up, he was asymptomatic and regained full ROM of left knee. Patient experienced functional improvement in that he was pain free and could squat completely.

DISCUSSION

Osteochondromas constitute 20% to 50% of all benign bone tumors1 and are considered hyperplastic-dysplastic developmental lesions of the growth plate. Extraskeletal osteochondromas are uncommon and distinct from skeletal osteochondromas3. They arise from soft tissues adjacent to the joint and can be classified into- synovial chondromatosis, soft tissue chondroma, and para-articular osteochondroma2. The likely pathogenesis is metaplasia from mesenchymal cells5. Knee is the most common joint involved. Extraskeletal para-articular osteochondroma of the knee is extra-articular and mostly arises from infrapatellar Hoffa's fat pad. The infrapatellar (Hoffa's) fat pad is an intracapsular extrasynovial structure. It is bounded superiorly by the inferior pole of the patella, anteriorly by the joint capsule and patellar tendon, inferiorly by the proximal tibia and deep infrapatellar bursa and posteriorly by the synovium-lined joint cavity. The fat pad is attached directly to the periosteum of the tibia and to the intercondylar notch superiorly by the infrapatellar synovial fold3. Various terminologies have been used to describe these para-articular masses like patellar osteochondroma, intracapsular chondroma, para-articular chondroma, giant extrasynovial osteochondroma and Hoffa's disease2. Though knee is commonly involved, it can occur at other sites such as hip, foot, and elbow.6

Reith et al. proposed a criteria for diagnosis of para-articular osteochondroma in 1997. The criteria states that it should be a non intra-articular lesion; presenting as a single, dominant mass; consisting of both bone and cartilage6. Thus it can be differentiated from synovial chondromatosis in which ectopic foci of cartilage develop in the synovial membrane of joints, bursae or tendon sheaths leading to generation of loose bodies, painful joint swelling and mechanical symptoms7. Benign cartilage lesions can be difficult to differentiate from slow growing, low grade chondrosarcomas which are cytologically similar to enchodroma. In soft tissue chondroma and chondrosarcoma, the tumoral matrix is entirely cartilage with no bony

elements. Diagnostic imaging helps to arrive at a clinical diagnosis in most cases.

Radiologically, plain radiographs demonstrate a large soft-tissue mass with wide central ossification. MRI shows radiological features of fatty tissue in the central ossified area(due to the presence of a high proportion of fatty bone marrow among the bone trabeculae). The surrounding hyaline cartilaginous tumor tissue appears as areas of low signal intensity on T1-weighted images and of high signal intensity on T2-weighted images with contrast enhancement 3. The differential diagnosis of calcified/ossified soft-tissue lesions about the Hoffa's fat pad include old hematomas, calcifying bursitis, tumoral calcinosis, myositis ossificans, crystal deposition disease, calcified synovial sarcomas, primary synovial chondromatosis, and synovial chondrosarcoma3. Clinicoradiological features along with histopathology confirm its diagnosis. Total excision is the mainstay of treatment and its recurrence is very rare2.

CONCLUSION

Para-articular osteochondroma, though rare, should be considered as a differential diagnosis in patients who present with extra-articular mass in the infrapatellar fat pad region of the knee, even in young patients. The most common differential diagnosis to be considered are synovial chondromatosis and low-grade chondrosarcoma. Hence careful clinicopathological and radiographic correlation is warranted. Total excision of the mass is the treatment of choice and its recurrence is very rare. Neverthless follow up is recommended.

Declaration: Informed consent was obtained from the patient.

REFERENCES

1. Murphey MD CJ, Kransdorf MJ, Flemming DJ,, FH. G. Imaging of osteochondroma: variants and complications with radiologic-pathologic correlation. Radiographics 2000; 20: 1407-34.
2. Natesan Rajkumar DS, Palanisami Dhanasekararaja, Shanmuganathan Rajasekaran. DOI: 10.13107/jocr.2250-0685.1386. Para-articular Osteochondroma of Patella with Coexisting Osteoarthritis. Journal of Orthopedic case reports; Volume 9 | Issue 2 | JOCR March – April 2019 | Page 87-89 |.
3. Hyojeong Mulcahy M, and Benjamin Hoch, MD. An extraskeletal para-articular osteochondroma of Hoffa's fat pad. Radiology case reports 2010; Volume 5(4).
4. Bombaci H BE. Infrapatellar fat pad para-articular osteochondroma: A ten-year follow-up and review. Arch Trauma Res 2015;4:e28381.
5. Maheshwari AV JA, Dhammi IK. Extraskeletal paraarticular osteochondroma of the knee--a case report and tumor overview. Knee 2006;13:411-414.
6. Reith JD BT, Joyce MJ. Paraarticular osteochondroma of the knee: report of 2 cases and review of the literature. Clin Orthop Relat Res 1997:225-232.
7. Adelani MA WR, Holt GE. Benign synovial disorders. J Am Acad Orthop Surg. 2008 May 16(5): 268-75.

Management acute joint bleed in People with Haemophilia: A Rehab perspective

Dr. Shiji Francis MD
Consultant Lissie hospital, Kochi

Haemophilia is an X-linked congenital bleeding disorder caused by a deficiency of coagulation factor VIII (FVIII) (in Haemophilia A) or factor IX (FIX) (in Haemophilia B). The deficiency is the result of mutations of the respective clotting factor genes.

Hemophilia has an estimated frequency of approximately one in 10,000 births. Estimations based on the World Foundation Hemophilia annual global surveys indicate that the number of people with hemophilia in the world is approximately 400,000 [1]. Haemophilia A is more common than haemophilia B, representing 80-85% of the total haemophilia population. Haemophilia generally affects males on thematernal side. However, both FVIII and FIX genes are prone to new mutations, and as many as 1/3of all cases are the result of spontaneous mutation where there is no prior family history.

The severity of bleeding in Haemophilia is generally correlated with the clotting factor level, as shown in Table 1

TABLE 1: RELATIONSHIP OF BLEEDING SEVERITY TO CLOTTING FACTOR LEVEL [2]

SEVERITY	CLOTTING FACTOR LEVEL	BLEEDING EPISODES
Severe	< 1 IU/dl (< 0.01 IU/ml) or < 1 % of normal	Spontaneous bleeding into joints or muscles, predominantly in the absence of identifiable haemostatic challenge
Moderate	1-5 IU/dl (0.01-0.05 IU/ml) or 1-5% of normal	Occasional spontaneous bleeding; prolonged bleeding with minor trauma or surgery
Mild	5-40 IU/dl (0.05-0.40 IU/ml) or 5-<40% of normal	Severe bleeding with major trauma or surgery. Spontaneous bleeding is rare.

Most bleeding occurs internally, into the joints or muscles

TABLE 2: SITES OF BLEEDING IN HEMOPHILIA [3]

SEVERITY	CLOTTING FACTOR LEVEL
Serious	Joints (hemarthrosis)
	Muscles, especially deep compartments (iliopsoas, calf, and forearm)
	Mucous membranes in the mouth, gums, nose, and genitourinary tract
Life threatening	Intracranial
	Neck/throat
	Gastrointestinal

TABLE 3: APPROXIMATE FREQUENCY OF BLEEDING ATDIFFERENT SITES

SEVERITY	CLOTTING FACTOR LEVEL
Hemarthrosis ▪ more common into hinged joints: ankles, knees, and elbows ▪ less common into multi-axial joints: shoulders, wrists, hips	70%–80%
Muscle	10%–20%
Other major bleeds	5%–10%
Central nervous system (CNS)	<5%

JOINT HAEMORRHAGE (HEMARTHROSIS)

A joint bleed is defined as an episode characterized by rapid loss of range of motion as comparedwith baseline that is associated with any combination of the following: pain or an unusual sensationin the joint, palpable swelling, and warmth of the skin over the joint [4].

The onset of bleeding in joints is frequently described by patients as a tingling sensation and tightness within the joint. This "aura" precedes the appearance of clinical signs. The earliest clinical signs of a joint bleed are increased warmth over the area and discomfort with movement, particularly at the ends of range. Later symptoms and signs include pain at rest, swelling, tenderness, and extreme loss of motion. Secondary muscle spasm follows as the patient triesto prevent motion and the joint appears "frozen".

TREATMENT:

The goal of treatment of acute hemarthrosis is to stop the bleeding as soon as possible

- Administer the appropriate dose of factor concentrate to raise the patient's factor level suitably.
- Instruct the patient to avoid weight-bearing, apply compression, and elevate the aected joint.[5]
- Consider immobilizing the joint with a splint until pain resolves.
- Ice/cold packs may be applied around the joint for 15-20 minutes every four to six hours forpain relief, if found beneficial. Do not apply ice in direct contact with skin [6].
- If bleeding does not stop, a second infusion may be required. If so, repeat half the initial loading dose in 12 hours (Haemophilia A) or 24hours (Haemophilia B).[5]
- Rehabilitation must be stressed as an active part of the management of acute joint bleeding episodes. [5,7,8]
  - ⇨ As soon as the pain and swelling begin to subside, the patient should be encouraged to change the position of the a□ected joint from a position of comfort to a position of function, gradually decreasing the flexion of the joint and striving for complete extension.
  - ⇨ This should be done as much as possible with active muscle contractions. Gentle passiveassistance may be used initially and with caution if muscle inhibition is present.
  - ⇨ Early active muscle control must be encouraged to minimize muscle atrophy and prevent chronic loss of joint motion.
  - ⇨ Active exercises and proprioceptive training must be continued until complete pre-bleed joint range of motion and functioning are restored and signs of acute synovitis have dissipated [9].
  - ⇨ If exercises are progressed judiciously, factor replacement is not necessarily required before exercising.

ACUTE SYNOVITIS:

Following acute hemarthrosis, the synovium becomes inflamed, is hyperaemic and extremely friable. Failure to manage acute synovitis can result in repeated hemarthroses [10,11].During this stage, the joint requires protection with a removal splint or compressive bandaging. Activities should be restricted until swelling and temperature of the joint return to baseline. In some cases, COX-2 inhibitors may be useful. Range of motion is preserved in the early stages. Differentiation between hemarthrosis and synovitis is made by performing a detailed physical examination of the joint. The presence of synovial hypertrophy may be confirmed by ultrasonography or MRI. Plain radiographs and particularly MRI will assist in defining the extent of osteochondral changes. With repeated bleeding, the synovium becomes chronically inflamed and hypertrophied, and the joint appears swollen (this swelling is usually not tense, nor is it particularly painful): this is chronic synovitis. As the swelling continues to increase, articular damage, muscle atrophy, and loss of motion will progress to chronic Haemophilic arthropathy.

The goal of treatment is to deactivate the synovium as quickly as possible and preserve joint function [12,13]. Options include:

- Factor concentrate replacement, ideally given with the frequency and at dose levels sufficient to prevent recurrent bleeding [14]
- If concentrates are available in sufficient doses, short treatment courses (6-8 weeks) of secondary prophylaxis with intensive physiotherapy are beneficial.
- Physiotherapy [15,16], including:
  - ⇨ Daily exercise to improve muscle strength and maintain joint motion
  - ⇨ Modalities to reduce secondary inflammation, if available [17]
  - ⇨ Functional training [18]
- A course of NSAIDs (COX-2 inhibitors), which may reduce inflammation [19]
- Functional bracing, which allows the joint to move but limits movement at the ends of range where the synovium can be pinched and which may prevent new bleeding [20].
- Synovectomy(chemical or radio isotopic synoviorthesis, and arthroscopic or open surgical synovectomy)

REFERENCES:

1. Stonebraker JS, Bolton-Maggs PH, Soucie JM,Walker I, Brooker M. A study of variations in the reported haemophilia A prevalence around the world. Haemophilia 2010;16(1):20-32
2. White GC 2nd, Rosendaal F, Aledort LM, Lusher JM,Rothschild C, Ingerslev J. Defnitions in hemophilia. Recommendation of the scientifc subcommittee on factor VIII and factor IX of the scientific and standardization committee of the International Society on Trombosis and Haemostasis. Tromb Haemost2001;85(3):560.
3. Aronstam A, Rainsford SG, Painter MJ. Patterns of bleeding in adolescents with severe haemophilia A. BrMed J 1979;1(6161):469-70.
4. Definitions in hemophilia. Recommendations of the scientifc subcommittee on factor VIII and factor IXof the scientifc and standardization committee of the International Society on Trombosis and Haemostasis.JTH 2012 (in press).
5. Hermans C, de Moerloose P, Fischer K, Holstein K, Klamroth R, Lambert T, et al; European Haemophilia Terapy Standardisation Board. Management of acute haemarthrosis in haemophilia A without inhibitors: literature review, European survey and recommendations. Haemophilia 2011;17(3):383-92.
6. D'Young AI. Domiciliary application of CryoCu in severe hemophilia: qualitative questionnaire and clinical audit. Haemophilia 2008; 14:823-7.
7. Gomis M, Querol F, Gallach JE, Gonzalez LM, Aznar JA. Exercise and sport in the treatment of haemophilic patients: a systematic review. Haemophilia2009;15(1):43-54.
8. Mulder K. Exercises for People with Hemophilia. Montreal: World Federation of Hemophilia 2006.
9. Heijnen L, Buzzard BB. Te role of physical therapy and rehabilitation in the management of haemophilia in developing countries. Semin Tromb Hemost2005;31(5):513-7.
10. Llinás A. Haemophilic arthropathy. Haemophilia 2010Jul;16(Suppl 5):121.

11. Rodriguez-Merchan EC. Musculoskeletal complications of hemophilia. HSSJ 2010 Feb; 6(1): 37-42.

12. .Rodriguez-Merchan EC. Aspects of current management: orthopaedic surgery in haemophilia. Haemophilia 2012;18(1):8-16.

13. Seuser A, Berdel P, Oldenburg J. Rehabilitation of synovitis in patients with haemophilia. Haemophilia2007;13 Suppl 3:26-31.

14. Manco-Johnson MJ, Abshire TC, Shapiro AD, et al.Prophylaxis versus episodic treatment to prevent joint disease in boys with severe hemophilia. N Engl J Med2007;357:535–544.

15. Blamey G, Forsyth A, Zourikian N, Short L, Jankovic N,De Kleijn P, Flannery T. Comprehensive elements of a physiotherapy exercise programme in haemophilia – aglobal perspective. Haemophilia 2010;16 Suppl 5:136-45.

16. Gomis M, Querol F, Gallach JE, Gonzalez LM,Aznar JA. Exercise and sport in the treatment of haemophilic patients: a systematic review. Haemophilia2009;15(1):43-54.

17. Watson T. Current concepts in electrotherapy. Haemophilia 2002;8:413–418.

18. De Kleijn P, Gilbert M, Roosendaal G, Poonnose PM, Narayan PM, Tahir N. Functional recoveryafter bleeding episodes in haemophilia. Haemophilia2004;10:157–160.

19. Tsoukas C, Eyster ME, Shingo S, et al. Evaluation of the efficacy and safety of etoricoxib in the treatment of hemophilic arthropathy. Blood 2006;107(5):1785-90.

20. Querol F, Aznar JA, Haya S, Cid A. Orthoses in haemophilia. Haemophilia 2002;8(3):407-12.

Quiz (Non - PMR)

1. Asymmetrical poly arthritis is seen in the following conditions except?

   (a) Reactive arthritis (b) Psoriatic arthritis (c) Systemic conditions (d) R. A

2. Arthritis caused by viral infections like Hepatitis A, B, C & Mumps is...

   (a) Oligoarthritis (b) Mono arthritis (c) Symmetrical Poly arthritis (d) Asymmetrical Poly arthritis

3. X-ray of 1st MTPJ shows periarticular erosions, normal joint space & soft tissue swelling. Which Rheumatological condition explains the X-ray picture best?

   (a) R. A (b) Reactive arthritis (c) Septic arthritis (d) Gout

4. Straight Leg Raising test helps to assess which all nerve roots?

   (a) L4, L5, S1 (b) L5, S1, S2 (c) S1, S2, S3 (d) L2, L3, L4

5. Diffuse mimics of Systemic Sclerosis include the following except?

   (a) Morphea (b) Eosinophilic fasciitis (c) Graft versus host disease (d) Hypothyroidism

6. Serum anti-HMGCR antibodies detect which Myopathy?

   (a) Diabetic Myopathy (b) Statin induced Myopathy (c) Mitochondrial Myopathy (d) Hypothyroidism associated Myopathy

7. The Griggs Diagnostic Criteria &The European Neuromuscular Center Diagnostic Criteria help to diagnose which Rheumatological condition?

   (a) Dermatomyositis (b) Statin induced Myopathy (c) Inclusion Body Myositis (d) Limb Girdle Muscular Dystrophy

8. Which HLA association greatly increases disease severity in R.A?

(a) HLA B5/B6 (b) HLA B8 (c) HLA DR8 (d) HLA DR4/DDR1

9. Synovial fluid examination under polarized light microscopy in CPPD reveals?

   (a) Negatively birefringent crystals (b) Weakly positively birefringent crystals (c) Needle shaped crystals (d) Rhomboid crystals (e) b & d (f) a & c

10. Regarding sclerotic reaction & joint space, with regard to gout, which of the following statements are true?

    There is no sclerotic reaction, Joint spaces are preserved until late

    (a) Neither of them (b) A (c) A& B (d) B

Expert opinion

Text Neck Syndrome Awareness and Prevention

Dr Sindhu K Nair, MD / DPMR, Senior consultant, General Hospital, Kochi

- Text neck is a repetitive stress injury and pain sustained from excessive watching or texting handheld devices like mobile phones and other devices for long periods of time.

Term was coined by Chiropracter Dean L Fishman. (1)

- Other Names – Turtle neck posture or anterior head syndrome. (1)
- Mechanism: When you look into mobile phone screen you bend your neck forward. This posture puts unnatural weight on your neck , shoulder and back, causing constant pain stress and injury.
- At 0 degree tilt, the weight is 4.54kg, at 15 degree tilt 12.2 kg, at 30 degrees 18.14 kg, at 45 degrees weight acting is 22.22 kg, and at 60 degree it is around 27.2kg. (1)

SYMPTOMS:

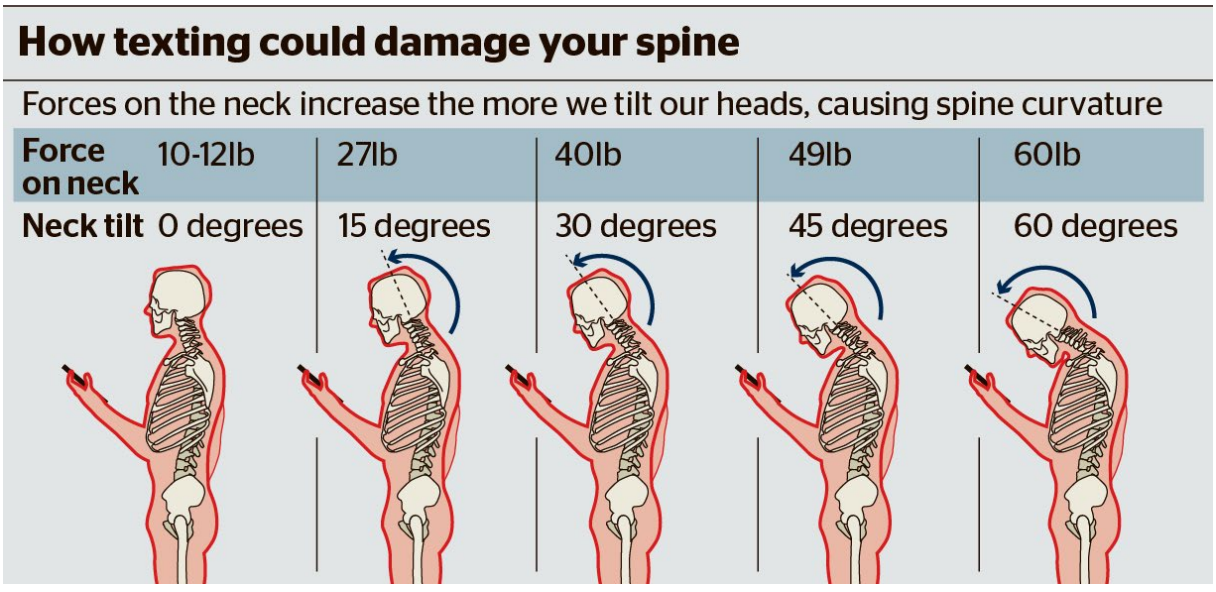
- Pain neck, upper back, and shoulders. Usually no radiation.
- Chronic headaches. Heaviness of eyes.
- Numbness in arms.
- Shortness of breath.

IDENTIFY:

- History, physical examination, and review of symptoms.
- Forward head posture and rounded shoulders.
- Usually student or corporate sector working people.

RISK:

- Early wear and tear on the spine.
- Straightening of the spine's natural curve.
- Chronic Neck and Back pain.



AFTER EFFECTS, IF UNTREATED (1)

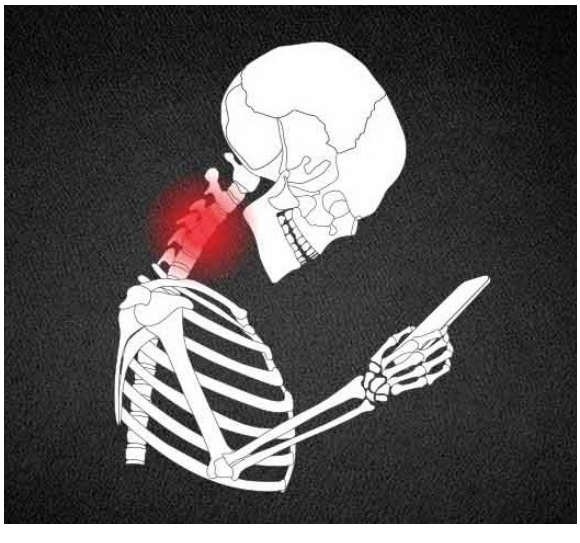
- Inflammation in neck ligaments, muscles and nerves.
- Increase/flattening of spinal curve.
- Early onset arthritis, TM joint pain.
- Spinal Misalignment.
- Spinal degeneration
- Disc compression/ herniation
- Nerve damage, Paraspinal muscle damage.
- Visual problems.
- Numbness in arms.
- Dizziness, Balance issues, chronic headaches and neurological issues.
- GI and Heart problems, Loss of lung volume capacity.
- Depression.

TREATMENT: (1)

- Medications-short course to ease pain and spasm
- Physical therapy .
- Home Exercises and stretches including neck scapular and upper back to increase strength and flexibility.
- Habit Modification.

ADJUSTMENTS:

- Stay in neutral position.
- Ears should be aligned with shoulders.
- Hold the phone in front of your face while keeping the back straight, phone should be closer to the eye level, so head need not bend to look at the screen.
- Take frequent breaks: stand up straight, Good posture with the chin tucked in and shoulder pulled back, keep the body aligned in a neutral position.
- Arch and stretch
- Exercise regularly.
- Restrict the number of hours you look into the screen.



CONCLUSION:

Use Your Phone Less To
Save Your Neck.
Stop Texting So Much

BIBLIOGRAPHY

Hansraj K.K. Assessment of stresses in the cervical spine caused by posture and position of head.
Surg Technology Int. 2014.

PROLOTHERAPY & PRP in Physiatry practice

Dr.Sasikumar.N, MD, DPMR,DNB, D.Med.Rehab
Consultant Kumar Centre, Kochi

PROLOTHERAPY or Proliferative injection therapy, also called Regenerative injection therapy is becoming very popular these days. Regenerative therapy gained momentum with the entry of PRP injections. Of late, simple ways of PRP preparation enable the Rehab Physician to do it as an out-patient procedure. Simple, and equally effective is Dextrose Prolotherapy. Both are safe, cheaper and more effective than Steroid shots with better patient compliance in the long run. The following article is about the usefulness of both in a Physiatrist's day to day practice.

DEXTROSE PROLOTHERAPY

Prolotherapy is an injection technique that was developed in the 1930s to help people suffering from TMJ or Jaw pain(1). In the 1950s George Hackett, MD pioneered research that suggested that people who suffered from low back pain did not need spinal fusion surgery if the cause of their back pain could be isolated to damaged and weakened spinal ligaments. Dr. Hackett's work was carried forward by Gustav Hemwall, MD(2). Often people researching Prolotherapy will come upon the term Hemwall Prolotherapy. This technique is named after these two doctors.

The major cause of degenerative arthritis and chronic pain is joint instability,(5)which involves ligament injury. Injured ligaments need to be correctly treated in order to fully restore joint stability. Prolotherapy treats and rebuilds ligaments.

The Prolotherapy procedure is considered a safe and affordable option that allows the patient to keep working or training during treatment.

It is typically best to treat all or most of the ligaments of an unstable joint if that joint or its surrounding structures are painful. Multiple joints and structures can be treated in each visit.

The injections are generally given every four to six weeks to allow sufficient time for new collagen growth.

MECHANISM

When a person sustains any type of musculoskeletal injury, the cells in our body react to that injury by bursting open and releasing many "responses to injury," as chemicals and substances into the blood and surrounding areas of the wound. One of these substances is the sugar D-glucose, which is also known as dextrose.

The release of these compounds initiates the body's inflammatory healing cascade and the body starts healing spontaneously.

When we have chronic, wear and tear degenerative damage occur in joints and spine. Just as we heal spontaneously, degenerative joint disease damages spontaneously. In chronic conditions we are being damaged more than we can heal.

Prolotherapy is the treatment that can restart the initial, accelerated healing process because

it uses dextrose as the proliferant, which is the same substance released by the body in response to injury. By doing so, Prolotherapy simulates as closely as possible, the exact healing cascade that is needed to heal injured soft tissues, such as tendons or ligaments.

Dextrose has been shown to increase the level of various growth factors involved in healing, growth factor, transforming growth factor-β, vascular endothelial growth factor, and fibroblastic growth factor. Comprehensive Hackett-Hemwall Prolotherapy involves injecting the dextrose proliferating solution at the bone-ligament junction (the enthesis) where the injury is typically located, although injections are sometimes given directly into the joints (intra-articularly).

Number of sessions depend upon the person's overall health status, the extent of the condition, injury, tear, or arthritis. The number of treatments that help a person to attain their goal averages 3 to 6 visits.

Many body parts can be treated at the same visit, which is convenient and cost-effective for patients who have multiple painful joints or more complex chronic pain.

Conditions that can be treated

It is an exhaustive list. Almost all painful conditions that a Physiatrist see can be treated with Prolotherapy. Other than pain, Prolotherapy is useful in conditions like recurrent dislocation of Shoulder and Patella, Avasular necrosis, headache, cervical and lumbar disc prolapse with radiculopathies, Non-cardiac chest pain, Fibromyalgia etc. It can be done from head to toe.

Technique of Prolotherapy

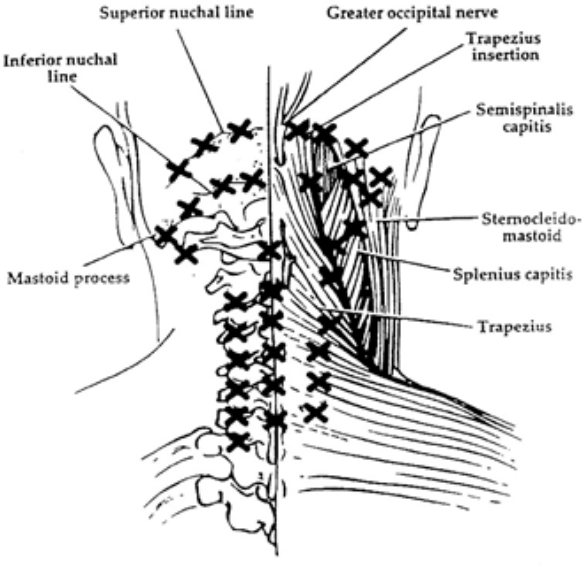
Although many solutions can be used for it, most popular one is 12 to 20% Dextrose. Standard glass vials available in India contain 25 ml 25% dextrose. 10 ml Dextrose can be diluted with 2 ml 2% Xylocaine in a 10 ml syringe that can accommodate12 ml is usually used.

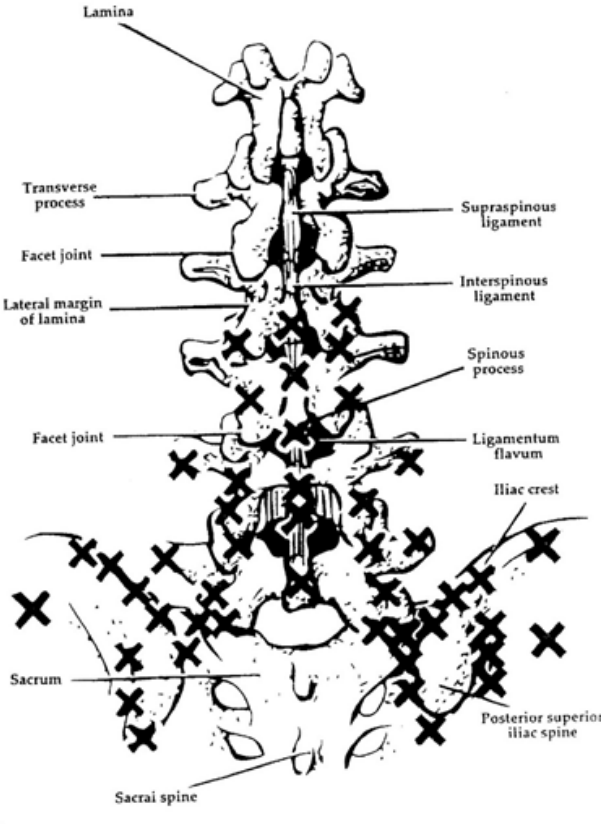
The golden rule is to touch the bone and inject. A good knowledge of ligament anatomy is essential. Palpate the tender points and mark the sites intended to be 0.5ml to 0.75ml per site is injected. Standard injection points are safe and away from vessels and nerves. Hence aspiration is seldom necessary.

COMPLICATIONS

There is hardly any complication from a well-delivered Prolotherapy session. The author has experience for the past 22 years. Annually about 10,000 sessions had been performed. Only one case of Supra-patellar pad of fat necrosis and infection happened, which was managed with IV anti-biotics. Flare-up of pain andsyncopical attack may occur.

Pictures of typical sites in the neck and back are given. Not all sites need to be injected.





PLATELET RICH PLASMA INJECTION THERAPY

In recent times, every major town in Kerala has someone performing PRP injection. Despite of lack of clear cut evidence (14), PRP is rapidly gaining popularity (15). It helps bone, muscle, and tendon cells to proliferate(7,8,9). This proliferation leads to the healing of damaged tissue and curing of chronic pain and injury

Several growth, healing, and repair factors are found in platelet rich plasma(10,11,12,13). These are the healing factors and what they do:

PDGF (Platelet-derived Growth Factor) initiates connective tissue healing through the promotion of collagen and protein synthesis. The primary effect of PDGF seems to be its mitogenic activity to mesoderm-derived cells such as fibroblasts (produces collagen a building block of new cartilage(3) The most important specific activity of PDGF is the creation of cartilage.

Vascular muscle cells help new blood vessels to bring healing factors to the injury.

Glial cells protect nerves and chondrocytes andbuild matrix.

VEGF (Vascular Endothelial Growth Factor) is the major regulator of vasculogenesis and angiogenesis and play an important role in tissue regeneration. It does so by creating new highways of blood vessels for the healing factors to get to the site of the injury.(16)

Transforming Growth Factor (TGF) including TGF-B1 stimulates chondrocyte (Cartilage growth) and decreases the catabolic activity (breakdown of cartilage). There is also research to suggests that TGF-B1 stimulates stem cell activity in the injured area.(17)

Recent evidence in literature has shown that PRP may be helpful both as an adjuvant for the surgical treatment of cartilage defects and as a therapeutic tool by intra-articular injection in patients affected by osteoarthritis(6).

Conditions that can be treated

Various tendinopathies and Osteoarthritis of joints, especially of Knee are the conditions where PRP can be injected.

Preparation of PRP

Different techniques are employed. Previously dedicated PRP separator machine was the only one available. Here blood is withdrawn, mixed with bovine serum and anti-coagulant and PRP is separated and injected. This method is expensive and can cause allergy or anaphylaxis with bovine serum. These days, simple PRP tubes are available, in which 8 ml blood is collected and centrifuged. RBCs are adsorbed and upper 2ml of plasma is discarded. Remaining plasma which is rich in platelets is withdrawn and injected immediately. About 6L to 10 L platelets per cm3 is ideal.(18)

Though not proved, addition of Calcium Chloride is said to activate Growth factors

Complications

Aggravation of pain for some days can happen.

BONE MARROW CONCENTRATE THERAPY

Bone Marrow Concentrate (BMC) Therapy, also known as Bone Marrow Aspirate Concentrate (BMAC) Therapy, is a promising cutting-edge regenerative therapy to accelerate healing in moderate to severe osteoarthritis (19)and tendon injuries(20).

While similar to Platelet Rich Plasma (PRP) in its ability to harness the body's ability to heal itself through the aid of growth factors, BMC also utilizes regenerative cells that are contained within a patient's own bone marrow. The marrow contains a rich reservoir of "pluripotent" stem cells that can be withdrawn from the patient's hip bone and used for the procedure. Unlike other cells of the body, stem cells are "undifferentiated", meaning they are able to replicate themselves into various types of tissue.

The physician removes a small amount of the patient's bone marrow and spins it in a centrifuge in order to generate a powerful concentrate that is injected into the injured area. In the past, these types of cells were often very difficult and expensive to obtain from the body. With recent medical advancements, the cells can be easily obtained and the procedure can be done with minimal discomfort by a simple office procedure.

While the full benefits of BMC are still unknown, it has been shown to reduce swelling, relieve pain, and enhance healing of articular cartilage and bone.

REFERENCES

1. Schultz LW: Twenty years' experience in treating hypermobility of temporomandibular joints, Am jSurgery 92:925-928, 1956

2 Hackett GS, hemwall GA Motogomery GA Ligament and Tendon Relaxation Treated by Prolotherapy : 5thedi. Oak Park IL Gustav A Hemwall 1992.

3. Oryan A, Alidadi S, Moshiri A. Platelet-rich plasma for

bone healing and regeneration. Expert OpinBiolTher. 2015 Nov 11. [Pubmed]

4 "Platelet-rich plasma promises pain relief and healing, but remains controversial" Orthopedics Today. Web. April 2013. Accessed April 29 2013. [Orthopedics Today]

5. Schultz, L. A treatment of subluxation of the temporomandibular joint. Journal of the American Medical Association. September 25, 1937

6. Khoshbin A, Leroux T, Wasserstein D, Marks P, Theodoropoulos J, Ogilvie-Harris D, Gandhi R, Takhar K, Lum G, Chahal J. The efficacy of platelet-rich plasma in the treatment of symptomatic knee osteoarthritis: a systematic review with quantitative synthesis. Arthroscopy. 2013 Dec;29(12):2037-48. doi: 10.1016/j.arthro.2013.09.006.

7.J Craniofac Surg. 2005 Nov;16(6):1043-54.Platelet rich plasma: biology and new technology.Pietrzak WS1, Eppley BL.

8.J Oral Implantol. 2014 Aug;40(4):500-10. doi: 10.1563/AAID-JOI-D-12-00104.

Platelet-rich preparations to improve healing. Part I: workable options for every size practice.

Davis VL1, Abukabda AB, Radio NM, Witt-Enderby PA, Clafshenkel WP, Cairone JV, Rutkowski JL.

9. Dhillon RS, Schwarz EM, Maloney MD. Platelet-rich plasma therapy – future or trend? Arthritis Res Ther. 2012 Aug 8;14(4):219.

10. Civinini R, Nistri L, Martini C, Redl B, Ristori G, Innocenti M. Growth factors in the treatment of early osteoarthritis. Clinical Cases in Mineral and Bone Metabolism. 2013;10(1):26-29. doi:10.11138/ccmbm/2013.10.1.026.

11. Marmotti A, Rossi R, Castoldi F, Roveda E, Michielon G, Peretti GM. PRP and articular cartilage: a clinical update. BioMed research international. 2015 May 5;2015.

KEY TO NON - P.M.R QUIZ

1. (d) R.A

   Rheumatoid Arthritis commonly presents as Symmetric Poly arthritis

   Psoriatic Arthritis & Reactive Arthritis commonly present as Asymmetric Poly arthritis

   Systemic conditions like S.L.E, Sarcoidosis can present as either Symmetric or Asymmetric Poly arthritis

2. (c) Symmetric Poly arthritis

3. (d) Gout

- X-ray features of Osteoarthritis(mnemonic LOSS) Loss of joint space, Osteophytes, Subarticular sclerosis, Subchondral cysts
- X-ray features of Rheumatoid Arthritis (acronym JSJL) Juxta-articular osteopenia, Soft tissue swelling, Joint deformity, Loss of joint space
- X-ray features of Gout (acronym PNS) Periarticular erosions, Normal joint space, Soft tissue swelling

4. (a) L4,L5,S1

   Femoral Stretch Test helps to assess L2,L3,L4 roots

5. (a) Morphea

- Local mimics of Systemic Sclerosis are:- (1) Morphea (2) Scleroderma en coup de sabre (3) Stiff skin syndrome
- Diffuse mimics of Systemic Sclerosis are:- (1) Eosinophilic fasciitis (2) Graft versus host disease (3) Metabolic conditions(PhenylKetonuria, Porphyria Cutanea Tarda, Hypothyroidism)

(4) Toxic agents(Silica, PolyVinylChloride, Bleomycin, Toxic Oil Syndrome)

6. (b) Statin Induced Myopathy

- Autoantibody directed against HMG-CoA Reductase is seen in Statin induced Myopathy.
- Some patients with Statin exposure develop an autoimmune necrotizing myopathy that progresses despite discontinuation of the offending agent.

7. (c) Inclusion Body Myositis

   Although pathological findings are highly specific when present in combination(presence of rimmed vacuoles, atrophic fibres, endomysial aotoaggressive inflammatory exudate & tubulofilaments on muscle biopsy), they lack sensitivity. However the combination of selective weakness of finger flexion & knee extension is believed to be typical of IBM & not present in other myopathies.

8. (d) HLA DR4/DR1

9. (e)

   Needle shaped negatively birefringent crystals in Gout

   Rhomboid shaped weakly positively birefringent crystals in C.P.P.D

10. (c)

The Cold Call

Cold calling: Soliciting business from customers with no prior contact.

Dr. Ravi Sankaran MD,
Associate Professor Department of PMR Amrita Institute of Medical Sciences, Kochi

In daily clinical care we face this situation in reverse when we have to make care plans but are unfamiliar with the diagnosis or its natural history. Despite having guidelines and EBM, customizing prescriptions requires experience. Here our specialists show us their thought process in a specific clinical situation, and compare it to the existing guidelines. With this you can gather enough information to be prepared for the patient on follow-up.

Diagnosis: Spastic diplegia, GMFCS 3

Chief complaint: Mom says her 5 year old male child can't walk. She brings him walking into your office holding one hand.

Goal of history:

- Confirm that this is CP and not Neurodegenerative disease
- Assess level and rate of reaching milestones- are delays related to the primary issue or complications?
- Assess current issues (seizure, infection, pain, etc)

Exam:

- GMFCS (ER)- provides information on the level the child performs at and what gains can be expected from there
- Phelps test/ Silverskiold test/ Duncan-Ely test- helps confirm Rodda classification
- Rodda classification- provides information on gait pattern, facilitating treatment planning
- Popliteal angle, Modified Ashworth Scale, GMFM-88- provides information on response to treatment

Treatment plan:

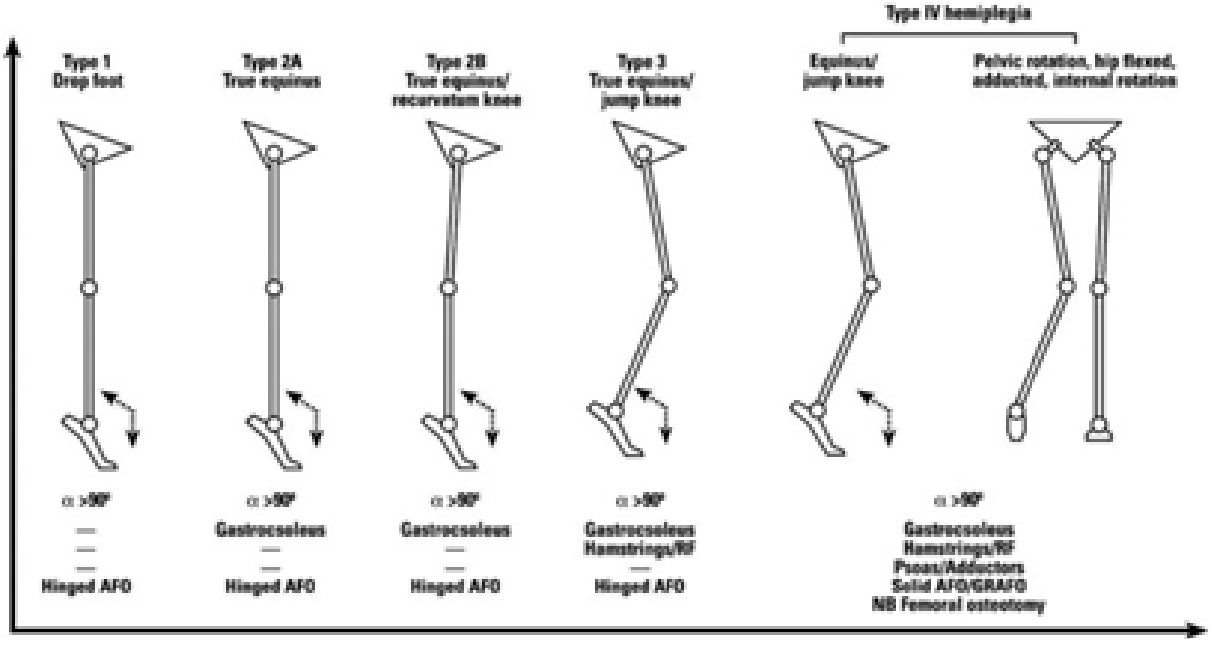
- Home exercise conducted by the family is critical to care outcomes. It empowers them to communicate with us about care issues, take responsibility for outcomes, preserve finances, and helps them understand what we look for as response to treatment. The simplest home program can be made using the child's favorite toys and the areas where they are deficient in the GMFM 88.
- Many families will not be comfortable with this and will request a Occupational/ Physical therapy prescription. This is acceptable if the family still participates in care, and the Physiatrist is guiding care.
- Oral antispastic- Per NICE guidelines these are to be given only when there are painful spasms, and functional restrictions. Often side-effects outweigh the benefits (1)

- Botulinum (2) - when a family is compliant with home exercises but focal spasticity persists or increases this is useful. The effect begins on day 3, is noticeable on day 7, maximal at 3 weeks and lasts for 3- 5 months.
- Selective Dorsal Rhizotomy- Oswestry criteria (3)

  History: Age 5-10, no chronic diseases, IQ >70, well motivated, good support system

  Exam: diplegia/ hemiplegic/ hereditary spastic paraplegia, spasticity MAS 2-4, overall lower extremity power >3, moderate movement and balance control, no joint deformities or dystonia

  Imaging: no hip dysplasia, no basal ganglia involvement in MRI, weight not disproportionately more than height
- Orthotics- Rodda classification will indicate which orthotic is appropriate. MAS less than 2 in the ankle will ensure the heel touches down in it when standing and walking



Legend: Rodda's classification of spastic diplegia.

Follow-up

- Monthly until they are progressing then once in 3 months, then 6 months
- Check popliteal angle
- MAS
- functional gains

Primary:

- Sit on mat, propped up on arms for 5 seconds (set 1)
- Walk 10 steps with both hands held (set 2)
- Walks down 4 steps holding rails and alternating feet (set 3)

Secondary: see items by set number

- If they are improving maintain the same program until the age of 9. At this point transition away from therapy services toward age appropriate activities.

References:

1. Spasticity in children and young people with non-progressive brain disorders, RCPCH, NICE guidelines July 2012
2. Best Clinical Practice in Botulinum Toxin Treatment for Children with Cerebral Palsy, Strobl W, Pascual IP, Placzek R, Toxins 2015, 7, 1629-1648
3. Selective dorsal rhizotomy for children with cerebral palsy: the Oswestry experience, G F Cole, Arch Dis Child 2007;92:781–785.
4. Rodda J, Graham HK. Classification of gait patterns in spastic hemiplegia and spastic diplegia: a basis for a management algorithm. Eur J Neurol 2001;8(suppl 5):98-108.

Members in Action

Dr. MITTU

MEDICAL CAMP IN AASHIANA REHAB CENTER

Spinal cord injury patients on 14th April 2019.

Out of 25 patients who attended the camp 11 were given customized wheelchairs at a later date by the motivation group.

Dr. HARIHARAN

Grand 49th year in succession!

- Gave talks in scientific bodies and annual conferences
- An article on International day of people with disabilities for IMA and published in their journal
- Attended to CBR activities in a voluntary organisation
- Attended a few monthly meetings of Trivandrum Physiatry Club and had given talks and chaired sessions
- Functioned as Management Committee Member in Cheshire Home, Trivandrum and as Expert for admitting their inmates with disabilities
- Motivational meetings with physiatrists in Trivandrum to promote activities of our association.

SANTOSH RAGHAVAN

We give professional guidance to community based rehabilitation activities done by "KARUNYAM" a student initiative under the aegis of Community Medicine department of this college.

As a part of CBR a disability detection and assistive devices prescription camp was conducted.

A team from National Institute of PMR, Thrissur also came to provide expert guidance. During that event we could get the expert services of two eminent occupational therapists from USA. They took classes on how locally available and simple materials can be remoulded/reshaped and can be utilized as assistive devices for disabled people. It was attended by a handful disabled individuals and the eligible one got registered for assistive devices.

A month after that program in a separate function presided by the Hon'ble Health Minister of the state various assistive devices for the disabled were distributed.

Another notable event that the department could take part was a disability camp conducted at Shanthibhavanam in Punnapra,

a care home for mentally and physically challenged destitutes. Along with department of

orthopaedics we have conducted the camp and could issue disability certificates for over 100 inmates there. It was a boon for a number of inmates since shifting them as a mass to disability board for certification was invariably a herculean task.

We could participate in a school based disability detection program at Mancompu, Upper primary school, Alappuzha district.

Dr. Santhosh.K.Raghavan, Additional Professor and current head of the department has presented a paper on "surgical anatomy of knee joint" during the annual conference of Kerala chapter of IAPMR at IMA House, Ernakulam.

In addition he has chaired a session on sports injuries of knee joint in the same event. He has presented another paper on "PMR in new curriculum" during midterm conference of IAPMR-Kerala chapter held in Thrissur.

Dr. CHARVAKAN.S,

Assistant Professor and

Dr. SIVARAM,

Lecturer of the department have attended the cadaveric workshop on ultrasound guided procedures in Jaipur.

Dr. NITIN MENON, RAJAGIRI

- Sending one member as part of palliative care home program
- Visited Blind school, Keezhamadu- for arranging therapy for blind children
- Given interview in Asianet channel- regarding spinal cord injury rehabilitation
- Given interview in Janam TV for – a) Activities of Physiatry / Stroke rehabilitation b) Pain management
- Given interview – in All India radio (AIR) regarding
- Stroke rehabilitation&Spinal cord injury rehabilitation
- Overall importance of rehabilitation in patient care
- Fly on wheels program - Organised a one day program for wheel chair dependent patients
- Delivered lecture as invited faculty in topic of a) Neuropathic Pain Management and b) Cervical Epidural Injections in IAPMR Con 2019 at Mumbai
- Delivered lecture as invited faculty in topic of Role of Physiatrists in Reducing ICU Stay in Delhi PMR Conf 2019
- Conducted Workshop in Pulmonary Rehabilitation for NAPCON 2019. (National Pulmonologists Association)

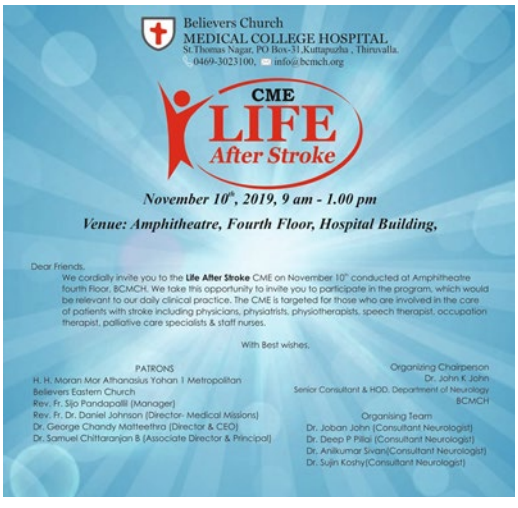
ROSHIN VARKEY

Professional Activities and Talks given in the year 2019

1) Secondary Hospital Posting as faculty (along with family) with the MBBS students of BCMCH during April –May 2019

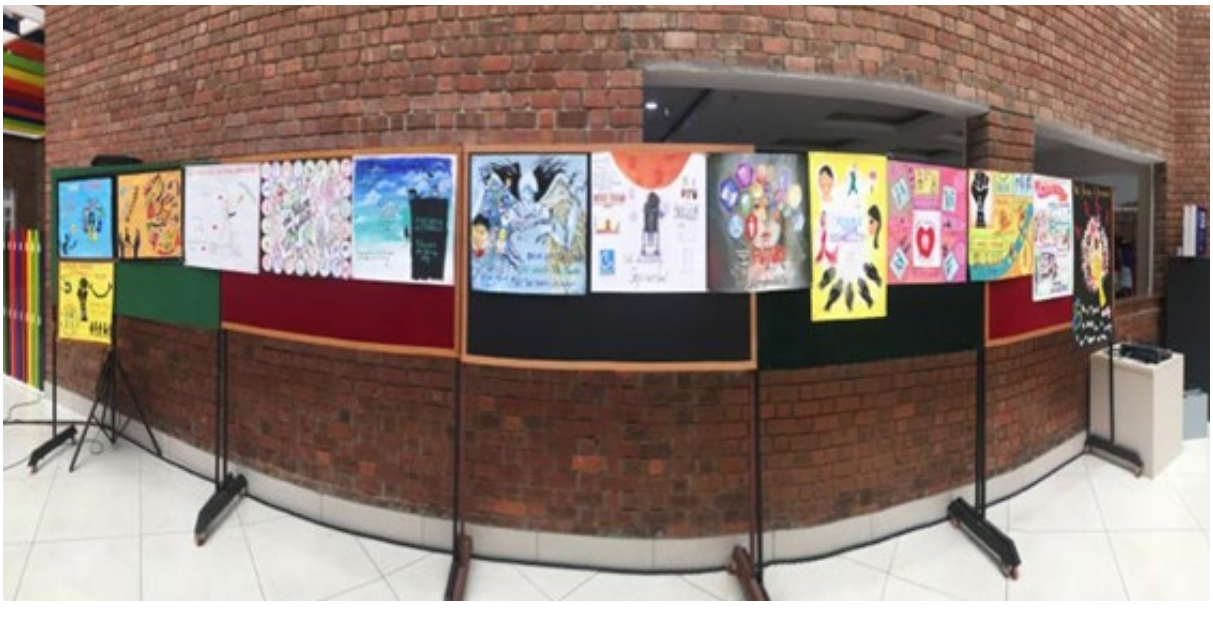
2) Put up a PMR Stall as part of Medifest organized by the medical students of BCMCH

3) Was Invited as faculty to give a talk on Expected Rehab Outcome after 1st week of Stroke in BCMCH organized by the department of Neurology, BCMCH



4) Organized and conducted community outreach camp and institutional programs on International Day of Persons with Disabilities on December 3rd , 2019

- Disability Identification, Assessment and Management Camp in Mahatma Jana Sevana Kendram, Kozhencherry



Dr. SHIJI FRANCIS

2019 January

NHM: For Palliative care Nurses and Physiotherapist (District level) at Muvvattupuzha

Topic: Rehabilitation of people with Chronic illness

NHM (State level) : for Physiotherapist

Topic: Rehabilitation in people with Haemophilia

February

Haemophilia Treatment centre Aluva: Feb 23

Topic: Importance of exercise in people with Haemophilia

Government Medical College Thrissur: Feb 28

Topic: Rehabilitation of people with Haemophilia

NHM Trivandrum: State level training program for doctors Feb 12

Topic: Musculoskeletal complications in people with Haemophilia

March 20

Haemophilia Treatment centre Aluva: training program for district level nurses

Topic: Management of Acute bleed in people with Haemophilia

April 17

Haemophilia Treatment centre Aluva: World Haemophilia day celebrations

Topic: Rehabilitation of people with Haemophilia

May 5

Haemophilia Treatment centre Aluva: During summer camp for patients

Topic: Rehabilitation of people with Haemophilia

August 24

Haemophilia Treatment centre Aluva: for patients

Topic: Role of exercise in people with Haemophilia

November 2

Haemophilia Treatment centre Aluva: Organised by NHM (District level) for Nurses

Topic: Management of acute bleed in people with Haemophilia

November 30

Haemophilia Treatment centre Aluva: Organised by NHM (District level)

Workshop for Doctors and Physiotherapist

Topic: Rehabilitation of people with Haemophilia

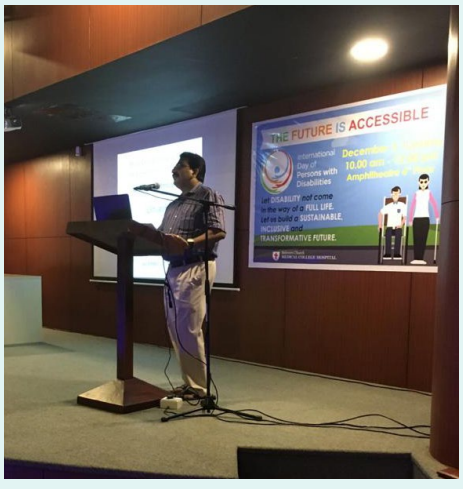
Lisie Hospital: Rehabilitation of people with Epilepasy

December 22

Haemophilia Treatment centre Aluva: Organised by NHM (District level)

Workshop for Doctors

Topic: Rehabilitation of people with Haemophilia



പരിമിതിയില്ലാതെ പറക്കാൻ ചിറക് നേടി അവർ

ലേണേഴ്സ് 11 പേർക്ക്, മെഡിക്കൽ സർട്ടിഫിക്കറ്റ് നേടി 74 പേർ

തൃശൂർ ▸ ആശുകയോടെയാണ് അവർ അയ്യന്തോൾ വനിതാ ഇൻഡോർ സ്റ്റേഡിയത്തിലെത്തിയത്. എന്നാൽ സ്വീകരിച്ച വണ്ടുള പരിശീലന പരീക്ഷണത്തിൽനിന്ന് ആശുകടം കടന്നു. അതോടെ ഭിന്നശേഷിക്കാർക്കായി നടക്കുന്ന പുതുക്ക ലേണേഴ്സ് പരീക്ഷ പരീക്ഷണമാവാതെ വിജയകരമായി കടന്നത് 11 പേരാണ്.

ചിറിച്ചു മുഖവുമായി ഉദ്യോഗസ്ഥരും ഹാജേഷൻ ഫോർ ഇൻഫർമേഷനൻ റിഹാബിലിറ്റേഷൻ വിഭാഗത്തിൽ വർക്കർ വിഭാഗത്തിൽ (ഫയർ) പ്രവർത്തക

അയ്യന്തോൾ വനിതാ ഇൻഡോർ സ്റ്റേഡിയത്തിൽ ഭിന്നശേഷിക്കാർക്കായി നടത്തിയ ലേണേഴ്സ് പരീക്ഷ

സൗമ്യേഷിയിരുന്നത്. 74 പേർ ലേണേഴ്സിന് തുടുള്ള മെഡിക്കൽ പരിശോധനാ സർട്ടിഫിക്കറ്റ് കരസ്ഥമാക്കി.

ആർടും ജനകിയ കുമാരി ഒൻ മാഗമായി ജില്ലാതലത്തിലും വിവിധ വകുപ്പുകളുടെ സഹകരണത്തോടെ നടത്തിയ ഭിന്നശേഷിസൗഹൃദ ലേണേഴ്സ് പരീക്ഷയുടെ ഉദ്ഘാടനം കളക്ടർ എസ്. ഷാനവാസ് നിർവഹിച്ചു. മോട്ടോർ വാഹനവകുപ്പ് ജോ. ആർ.ടി.ഒ. ശ്രീപ്രകാശ്, സുധീർ, എൻ.ഐ.സി. യിലെ ഇൻഫർമേഷൻ ടെക്നീഷൻ സുരേഷ് എന്നിവർ സഹായവുമായി ഒപ്പം നിന്നു. നാഷണൽ ഹെൽത്ത് മിഷൻ ജില്ലാ പ്രോഗ്രാം ടെക്നീഷൻ ഡോ. സനീഷ് ജനുത്തും നൽകി.

ജില്ലയിലെ മറ്റ് കേന്ദ്രങ്ങളിലും, ഭിന്നശേഷിക്കാർക്കായി ലേണേഴ്സ് പരീക്ഷാസൗകര്യമൊരുക്കുമാണ് ഫയറിൽനിന്ന തീരുമാനം.

Doctors in politics are we prepared for the show?

A commentary by Dr.Santhosh.K.Raghavan; Additional Professor of PMR: GTDMCH, Alappuzha.

"One of the penalties for refusing to participate in politics is that you end up being governed by your inferiors"

Plato (427 BC - 347 BC)
"Medicine is a social science, and politics is nothing else but medicine on a large scale."

Rudolph Virchow, German physician noted in 1848

INTRODUCTION

Today's world is too much complicated and complex with notable developments in every field. The arena of medicine is also not an exception with sea of new progresses, challenges which demand rapid responses. Consequently medicine and healthcare are slowly turning in to a business. You may wonder why a physician; a well trained individual loaded with tons of medical knowledge and skills for doing various tough procedures should delve in to the chasms of politics which we consider as messy, boisterous and at times scary and not evidence based contrary to clinical medicine which is an evidence based applied science? Let me present you a simple example, recently the healthcare in United States of America has faced a sudden jolt as the reigning Republicans have decided to strip millions of Americans from insurance cover, the insurance companies have decided to stop services for patients with preexisting conditions, for paediatric patients, for lab tests and for ambulance rides and we can imagine the plight of millions of hapless patients. The renowned independent daily "Guardian" has simulated the situation to an airplane ride with all cabins suddenly got open and the occupants are in danger of an imminent exit without a parachute. Very precarious situation, is it not? When we come to the Indian scenario the situation is even more precarious. A major bane affecting healthcare access has been what Amit Sengupta,of the Delhi Science Forum, labels as"India's70-70 problem"—namely,that70% of health care expenses in India are borne by people from their pockets, of which 70% is spent on medicines, with episodes of illness driving people to impoverishment. A model of public procurement of drugs as implemented in the states of Tamil Nadu and Rajasthan has been shown to lower the cost of medicines and allow free access to generics. However, recent reports from Rajasthan suggest that a lack of political will maybe weakening the landmark free medicines scheme in the state1. These are the ways in which politics affects medicine and hence they are inextricably intertwined and yet they are very different enterprises2. As envisaged in Hippocrates oath the primary responsibility of physician is to provide optimal healthcare for the patient. This can be in the form of a pill

or a bill. If we want to apply and maintain the political pressure during deliberations on a bill directly affecting our patients our active political participation is mandatory. The reason for all the jostling, maneuvering and strategizing during formulation of a bill is that there is never enough to go round for all the interested parties. The pie has to be divided and not everybody gets their share of it3. While collective decision making is a solution, the desire to push individual agendas using every available means. This serves as to influence the decision making process and operates as political pressure.

How do we ensure our political pressure?

First and foremost we should utilize our right for franchise. There are no definite statistical figures to show regarding the percentage of doctors who have voted in the last general elections in India but the figures are abysmally low from another major democratic country in the world namely United States of America; where the figures from Kentucky projects only 25%.4 As noted by Dr Ralph Alvarado, a Physician-senator from Kentucky "Physicians are some of the most widely respected, trained, and educated individuals in a community. The lack of involvement of such a group in leadership can only be damaging to a society". Hence it is clear that our lack of involvement in the political process shall be damaging to the society that has bestowed us the professional status.

Second we can campaign and contribute for Medicine friendly politicians and the relation shall provide dividends for our profession in the long run. Through them during discussions on medical bills we can express our strong opinion and thereby we can have our say in the formulation of bills.

Third thing we can do in the political process is to run for public offices sacrificing our personal and professional lives and that is strictly a personal choice.

A Commonwealth Fund study in 2006 (JAMA) found that nearly all physicians believe they should play public roles, and two-thirds are actively involved in community activities, political work, or advocacy. The researchers envisioned three types of public roles for physicians: community participation, political involvement in health issues (other than voting), and collective advocacy through professional organizations.

Community participation- Last year Kerala has faced one of the worst floods in its history. All the health care delivery systems of the state and across the country have actively participated in the rehabilitation process of flood victims. Subsequently the yeoman services were rendered by our colleagues for hapless victims of "Gaja hurricane" in Tamil Nadu. Apart from such need based services we conduct several screening camps for the early detection of clinical conditions so as to prevent the extent of morbidity and mortality.

Political involvement in public issues- The American Federation of Obstetricians and Gynaecologists have successfully fought several women issues before the American congress. Similarly studies by Indian Psychiatric society have confirmed the equal vulnerability of children for abuse irrespective of their gender and this became an eye opener for the policy makers and law enforcers.

Collective advocacy through professional organizations- The Indian Medical Association (IMA) has decided not to endorse any of the aerated soft drinks in view of their potential health hazards. A full-fledged anti quackery cell is operational in IMA in order to prevent the menace of quackery and to assist the law enforcers to nab the culprits. Here we can remember the valiant fight by IMA against some of the provisions in the proposed National Medical Commission bill especially against the bridge course which allows a person from Ayush systems (Ayurveda, Homeo, Unani etc) after completing a bridge course can start practicing modern medicine. The Indian association of Physical Medicine and Rehabilitation (Kerala Chapter) is currently fighting a case against Physiotherapists who wants the right for independent clinical practice and they should be considered as primary care doctors. These are all notable examples for public participation by doctors so as to provide state of the art health care for the public.

What are the disadvantages of medical politics?

- Involvement in public life takes away some of your most valuable resources at our disposal; professional, academic, administrative and creative time.

- Personal, academic, administrative and professional practice is often strained because of competing priorities in a week.
- The losses shall extend from personal level to our immediate families and friends, the organizations you work and in instances, the very patients you set out to protect. That is the paradox of the story. The emotional wear and tear on the individual with moments of anxiety, embarrassment, and rage tends to accumulate over time3. It is not uncommon to see episodes of euphoria interspersed with interminable periods of melancholy which can make our lives boring and at times scary.
- When you finally decide to abdicate, you may find it hard to let go. Depression, anger and disgust are not uncommon and you may forget all the good things that have been done and may develop a sense of self pity. This is especially true if the change-over has been filled with lots of turbulence, acrimony and "death to the end" battles and as we know in politics such scenes is not uncommon. Sometimes you may even resent the successor and have to fight with them, even if he or she is of your own choosing.
- In politics set yourself a target of number of years or specific objectives and leave once that is achieved, with a good feeling. If you lead or have been involved in many organizations, perhaps the best time to go is early on your prime, when you are still at your best as the time old saying" stop singing; when your voice is perfect". Do not wait until the politics of the organization find you as a degenerating organ and drive you out. Beware of sycophants; they will always tell you are the best man for the job and that no one has your vision and your drive, but don't fall for that! Most of them also carry vested interests and may be afraid of change since a change in leadership can make the atmosphere difficult for their survival.
- Sometime you may find yourself in high pressure situations and you have to rub shoulders with the powerful and influential for decision making at local, national or even international levels. At all such levels you have to prepare your psyche and intellect to handle such occasions.
- Even though the great physician William Osler found health policy to be dull, eschewed political action committees as undignified and advised physicians to abstain from politics, there are those who believe that in today's practice this laudable philosophy limits the health policy potential of the doctor-patient relationship3. The price of a physician's closeness to his patients' needs and experiences is to assume responsibility to look after their interests which is the primary duty of any doctor as envisaged by Hippocrates oath. An effective form of advocacy available to every physician is education; Patients, who are voters, must be empowered with knowledge so as to shape the state and central policies that directly influence their healthcare.

Conclusion

Judicious political involvement by physicians is of paramount importance since it supports interests of patients and collective health of the society and not doing so is not only unethical but also an unprofessional activity.5

References

1. BMJ2014;348:g2901doi:10.1136/bmj.g2901(Published23/04/2014)
2. Q J Med 2003; 96:695–697 doi:10.1093/qjmed/hcg119
3. Medical politics 101;BJJ Abdullah, MBBS, FRCR and KH Ng, PhD, MIPEM, DABMP
4. Ralph Alvarado, MD FACP, Kentucky State Senate – 28th District, Physicians Role in Politics Involvement Crucial to the Commonwealth, Kentucky doc • Winter 2017
5. Lauren Vogel, Should doctors talk politics with patients? CMAJ, 2018 April 23;190: E5201. doi: 10.1503/cmaj.1095589.

Research is fun!

Dr. Ravi Sankaran MD,
Associate Professor Department of PMR
Amrita Institute of Medical Sciences, Kochi

Research can be daunting to enter, but is critical to self improvement and good outcomes. Below is a 'challenge protocol' designed to train busy clinicians to self-audit. Those who choose to do this can write a description of their outcomes using the template at the end of this. That can be submitted for publication in the next journal release. The editor will do the statistical analysis if you can't. The following is a very simple challenge

Topic: A 5A's of communication as an intervention in myofascial pain syndrome.

Introduction: The 5As (Ask, Advise, Agree, Assist, Arrange) are a clinical tool recommended for health behavior counseling.

Aim- to examine impact of clinician communication using the 5 As in discussion of pain management

Design- Observational

Study setting- your OPD

Participants / Clinicians- track compliance and VAS when using the 5 A's

Intervention: Implementation in clinical practice:

Ask permission to discuss pain; be nonjudgmental and explore the patient's readiness for change.

Assess pain; explore drivers and complications of chronic pain.

Advise the patient about the health risks of pain, the benefits of control, the need for a long-term strategy, and treatment options.

Agree on realistic pain control measures, targets, behavioral changes, and specific details of the treatment plan.

Assist in identifying and addressing barriers; provide resources, assist in finding and consulting with appropriate providers, and arrange regular follow-up.

Patients performed on (n)

Metrics

Dependant variables: age, gender, comorbidities

Independent variables

Qualitative: VAS, compliance

Quantitative: feel better y/n

Study duration: from initial interview to follow-up 1 and 2 months

Inclusion criteria: Age 30-60, less than 3 co-morbidities, pain duration > 3mo and < 5 years

Exclusion criteria: previous MSK surgery, radiculopathy and any other Neurological disorders, not received injection/ invasive procedure

REPORT TEMPLATE

Paste this into excel as you enter data. All data returned should be sent in .xl format

	5A's y/n	Age	Gender	Co-morbidities	VAS- pre	VAS 1	VAS 2	Compliance	Feel better y/n	Feel better y/n
1										
2										

etc

Based on:

A 5A's communication intervention to promote physical activity in underserved populations

Carroll JK, Fiscella K, Epstein RM, Sanders MR, Williams GC

BMC Health Services Research volume 12, 374 (2012)

AI and PMR: Paradise Lost or a Return to Eden?

Dr. Ravi Sankaran MD,
Associate Professor Department of PMR Amrita Institute of Medical Sciences, Kochi

Artificial Intelligence (AI) and Robotics are slowly automating the world we live in. AI is revolutionizing healthcare as well, redefining roles we once took for granted. Change is inevitable. This article exposes the shift and ventures into the potential effect on (Physical Medicine and Rehabilitation) PMR.

Diagnostic Medical AI is on currently par or better than specialists in: detecting cancer in a mammogram (1), diagnosing heart disease (2), detecting skin cancer with smartphones (3), and diabetic retinopathy (4). Therapeutic Medical AI is also being rapidly deployed. In England, Chatbots provide medical advice instead of nurses (5).The first remote surgery was done in 2001 with the surgeon in New York City and the patient in France using a robot on a data link(6). AI-assisted surgery can guide the surgeon intra-op and provide new optional surgical techniques in real time (7). AI-based telemedicine has replaced primary care in areas of need in the US (8). Virtual nursing assistants (9) can monitor patients 24 hours a day, seven days a week. It is predicted that medical AI will enter 90% of hospitals (10) and do 80% of a Physician's daily work (11). All these gains are not without loss though. While recipients benefit, human service providers become redundant. A recent study shows surgical resident training time gets reduced from 240 minutes to 15 minutes per case once a robot comes in. Apprenticeship and On the job learning across many fields is being drastically reduced. This will result in a succession gap, as the senior generation superannuates there will be less experienced incumbents to fill their positions. (12) Once the human genome is unwound, AI will even affect preventative care. (13) So how does this affect the fourth face of healthcare, rehabilitation? Before we talk on that lets look at AI and the current state of healthcare.

The existing subsets of AI are all specific. They can repeatedly do one task to expert level, but not many simple tasks. Moore's Law states that computer speed/ capability will increase, and cost will reduce. This means the technology will continue to make leaps and bounds. What does it mean to the average doctor? We routinely gather patient details like gender, race, ethnicity etc (categorical) and age, Ashworth score, functional independence measure (ordinal) as we make a diagnosis. Each of these is a data point, and multiple patient details become a data string. AI can compare multiple strings and find correlation, association, interaction in ways we can't. The following example details the difference this will make. In clinical work when choosing which neurostimulant to use for a patient with a brain injury (TBI) we start with what drugs the patient was on before, how they responded, then match this to the history, clinical exam, scales, labs and radiology. Having decided which agent to use, some refer to a formulary (possibly in the smartphone), and check for drug interactions and contraindications, then prescribe. As this is experiential there will be wide differences between practitioners though. AI can simplify and accelerate this process, along with compile all the prescriber's experiences. Additionally it could even factor in socio-economic status, drug availability at local dispensaries, price options with brand molecular bioavailability, and total cost to the patient including travel from home to

pharmacy by bus, car, or bike, and even factor in the weather! A problem emerges though. Algorithms approach data sets differently and this generates bias. This can directly affect someone's health. Also these data points are built on information gathered by us. If that also gets automated, our health will no longer be in our hands.

Another problem algorithms have is processing data that is intentionally fed incorrectly/ 'lying'. 'You can fool some of people all the time, all the people sometime, but not all the people all the time.' (14) We can usually intuitively detect ulterior motives. Unsupervised AI cannot though and might accidently enable malingering and self-harming behavior.

Who owns the data is the next issue. Having been compiled and shown to improve efficacy, our personal data will become a commodity, sold to the highest bidder. If pharma buys it, direct advertising to one's smartphone could follow. If insurance companies get it, they might use it to persuade clients into higher premiums or more expensive packages. The government could do anything with this depending on capitalist or socialist leanings. Hitler's eugenics program would look pitiful in comparison.

Automation as a process is not without problems. The average store has a human cashier, who also bags the products. Twenty years ago automated checkout stations came to US supermarkets. These are basically unmanned stations where people show their product to a barcode reader and bag their purchases afterwards. People use it to facilitate stealing from the store. They justify this wrong behavior by saying the store is 'turning them into' cashiers and item baggers. Theft happens by not charging items despite being on camera (by not showing items to the barcode scanner), or switching barcodes to cheaper items hence paying less for a higher quality item (replacing a 2kg beef barcode with one for 0.5kg of fruit). Regardless most stores still maintain these automated stations and absorb loses rather than hire people.(15)

AI can tell who, where, what, and how, but not why. While the prior are objective, the last is subjective/ abstract hence out of its league. A knife can be used to carve wood, do surgery or commit murder? The AI won't be able to determine intention. Because emotion factors into our actions, AI's logic cannot predict our response. AI also lacks human intuition/ fuzzy logic, the manifestation of abstraction. A robot can give 10 spot differential diagnoses for a TBI patient in distress, but not detect their gastro-intestinal bleed by the smell of the patient after a bowel movement. A Physician can, and by virtue of that prevent unnecessary testing, by going straight to treatment.

Accountability is the most pertinent issue though. When AI diagnoses what a doctor misses, its superiority is declared with pomp. Treatment decisions based on computed data owned by non-Physicians may be wrong. When it is though, it's out of the spectrum of their training, hence absolving them of malpractice. It leaves one wondering who is accountable when AI is wrong and Dr is right but patient still gets a bad outcome?

For all the projected glory studies show, people are unwilling to use these services. (16) The smartphone skin cancer app is only good for Caucasians. In any other race it over diagnoses the same and is a failure. When care was provided by AI versus a human, patients were less likely to utilize the service and wanted to pay less for it. They preferred a human provider knowing there may be a greater risk of an inaccurate diagnosis or a surgical complication. People view themselves as unique, and this includes personal health. AI medical care is perceived as too rigid for individual differences. Can an algorithm really diagnose our problem? If something goes wrong at least they have a person to blame. How do you sue a machine? Interestingly, people are ok with medical AI when a physician has the final word. (16) As technology infiltrates our healthcare roles, humans are resisting. With resident training hours jeopardized by operating robots, human's unique talent has reemerged. The same adaptability that helped us become apex predators and go into space, helps our trainees adapt to a less learning-conducive environment. Residents successful at robotic surgery reduced their basic education to do more robotic surgery, or practiced digitally by watching recorded videos (100 times more than required). While this is problematic, they've adapted. The point is while one should struggle to improve, expert support (to prevent problems and to take responsibility) is a must. (12).

As data is gathered and systematized we can expect a transient splurge in diagnostic information with a growth in such fields. This will eventually taper down. Physicians may eventually become the interface between AI and human, and Surgeons puppets in the robot hand. We currently have

generations of people who have no idea what life was like pre-car, pre-computer, or pre-cellphone respectively. Eventually people may not know how humans contribute to healthcare. Naturally there will be less need for those who 'know', and more for those who 'know how'. For all the changes one thing seems inevitable, eventually doctors will not need to be megabrains or have gifted hands, only people with compassion. Many of us get into healthcare to serve people, so this is not so bad an outcome.

Ever since modern medicine became the prevalent form of care, there has been a deficiency in providers. India still doesn't meet the needed Dr: patient ratio (17) and there remains a deficiency of service in areas of need. In the west paramedicals have been empowered to reduce this. With the supply meeting the demand the result is more healthcare expenditure which fuels the economy. When did a person's wellbeing become monetized? The Health Maintenance Organization Act of 1973, was introduced by President Nixon. (18) This allowed medical insurance agencies, hospitals, clinics and even doctors, to function as for-profit business entities instead of the service organizations. From here corporations emerged, and other countries copied. "The sole purpose of a business is to generate profits for its shareholders." (economist Dr. Milton Friedman 1970).This is a big deviation from the WHO statement about health being a right. Currently good health is a commodity, accessible only to the affording.

Healthcare as a product in the market is flawed. Currently only a few companies have all the power. Along with that there is minimal market heterogeneity. While prescriber behavior varies, prescription options are limited. A person can change their cellphone home screen 300+ times, but for hypertension there are only a handful of drug options. Individual factors are ignored in the prescription unless a contraindication, adverse reaction or drug interaction exists. AI could change this by the complexity of data it can process. All of his means a few things: while actual cost for care might come down along with job options, customer end costs might not. AI will introduce a new level of specificity in what we have to offer, provided we are fluent with it. As world markets rapidly change with AI, companies like Alibaba lead simply because they have adapted. (19)

Modern Medicine prolongs life, but doesn't promise quality. PMR is different though we use similar diagnostics and therapeutics. As much of our work is qualitative it can't be analyzed and automated. Outside of functional scales, we don't have large existing databases. Restoration/ preservation of function isn't dependant on lab values or imaging, they are adjuvants to making a plan not the ends. PMR is such a wide field, practitioners often end up super-specializing. Pain and Neurological rehab are the most common areas. Some aspects like Orthopedic rehab are so simplified/ routine in many places it is done without medical supervision. The following are speculations of how AI will impact our multifaceted profession.

Prosthetics and Orthotics (P and O) will go first. Computer Assisted Drawing and Manufacturing technology with satellites will make it easier for P and O companies to go mobile. Senior technician's experience will help automate the process of limb fitting. The majority of patients will experience ease of care and likely never see a Physiatrist. To decentralize power and seize more market share the P and O corporations will get hire surgeons with a resident Physiotherapist, and P and O technician. Surgeons will do the procedure and post-op wound care, and the rest will go to paramedicals. Complicated cases will not be do-able by machines, and the experience base in PMR after 4 decades may be minimal. While the winners and losers are clear, here patients will be both.

Electrophysiology- Software to facilitate diagnosis is already underway. Surface EMG montages will simplify set-up. While a 'clinical correlate' disclaimer will accompany, many reports will come from trained technicians using such software. EMG is perhaps the only part that can't be fully automated and may result in a complex referral process.

Pain- is a multimodal etiological symptom of dysfunction which is highly subjective. This needs a human touch to sort out genuine pain from malingering.

Neuro-rehabilitation: Once the acute issues are addressed many patients end up in centres without trained Physicians. People want convenience. Unlike other diagnoses much of care is still medical, and here is a strong subjectivity present. Robots can do therapy, Brain computer interfaces may change what we have to offer and how. Regardless they can't decide what to do and when to stop. Either PMR or PhD PTs will manage this service.

CONCLUSION

Bharithrahari in the Vairagya Satakam tells us 'The root of health has always round about it a thousand worms in the form of dangers and disease'.(20) While most of his article will leave people bothered, there is still hope. The following are ways our colleagues have adapted to AI so far. We can learn from them. Survival means having stability and growing at the same time. The foundation to preserve for future doctors is: ensure opportunities to make mistakes and learn in real life, allow the best to become teachers, redesign responsibility so residents can learn how to work with AI, make an accessible collection of expert guidance. To expand we must keep studying AI as it revolutionizes medicine. Knowing its nuances allows us to preserve our presence in healthcare, using it to shape care can improve productivity and enhance on-the-job learning, and lastly allow AI to be part of the solution.(21)

BIBLIOGRAPHY

1. JNCI: J. Natl. Cancer Inst. 10.1093/jnci/djy222
2. https://www.nytimes.com/2016/10/17/ technology/ ibm-is-counting-on-its-bet-on-watson-and-paying-big-money-for-it.html
3. Man against machine: diagnostic performance of a deep learning convolutional neural network for dermoscopic melanoma recognition in comparison to 58 dermatologists H A Haenssle, L Thomas, Annals of Oncology, Volume 29, Issue 8, August 2018, Pages 1836–1842
4. Abràmoff, M.D. Pivotal trial of an autonomous AI-based diagnostic system for detection of diabetic retinopathy in primary care offices. npj Digital Med 1, 39 (2018
5. https://techcrunch.com/2017/01/04/babylon-health-partners-with-uks-nhs-to-replace-telephone-helpline-with-ai-powered-chatbot/?renderMode=ie11
6. https://en.wikipedia.org/wiki/Lindbergh_operation
7. https://hbr.org/2018/05/10-promising-ai-applications-in-health-care
8. https://www.techrepublic.com/article/how-telemedicine-keeps-patients-in-rural-communities-healthy/
9. https://www.careangel.com/
10. https://www.forbes.com/sites/reenitadas/2016/03/30/ top-5-technologies-disrupting-healthcare-by-2020/#570b1f776826
11. https://fortune.com/2012/12/04/technology-will-replace-80-of-what-doctors-do/
12. (https://hbr.org/ideacast/2019/08/how-robots-and-ai-are-changing-job-training).
13. (https://www.beckershospitalreview.com/healthcare-information-technology/how-artificial-intelligence-impacts-preventative-care.html)
14. Abraham Lincoln
15. https://www.theatlantic.com/magazine/archive/2018/03/stealing-from-self-checkout/550940/
16. https://hbr.org/2019/10/ai-can-outperform-doctors-so-why-dont-patients-trust-it
17. https://www.downtoearth.org.in/dte-infographics/61322-not_enough_doctors.html
18. http://healthoverprofit.org/2017/03/19/for-profit-health-care-used-to-be-illegal/
19. https://hbr.org/ideacast/2018/09/how-alibaba-is-leading-digital-innovation-in-china.html
20. Vairagya satakam Seventh Edition, August 1976 De novo printers, Calcutta
21. https://hbr.org/2019/09/learning-to-work-with-intelligent-machines

WANTED

AUTHORS

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- The ''cold call'. Comment on your approach and follow-thorough for a specific issue in patients with myofascial pain. Focused history, relevant exam, DDs, treatment plan versus current guidelines, follow-up till treatment end.
- Case reports in myofascial pain syndrome
- Quantify this- Name a scale you use regularly in myofascial pain and what is good/ bad about it in detail.

COMMUNICATOR

- Resident's corner/ Things I learned after residency- How an event shaped you as a doctor/ humorous stories from work
- Members in action- show us your professional activities since the last issue
- Comments / responses to the prior articles

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Authors can respond to the following query. 'When do you refer your patients with pain? To which services do they go?' Algorithms with objective measures are preferred.

PROFESSIONAL

Respond to the following query.

Why is research critical to survival of our field?'

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