



Anatomica-AIMS



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A Message from the Editor

With the divine blessings of
bhairavaikya paramapoojya jagadguru
SRI SRI SRI BALAGANGADHARANATHAMAHASWAMIJI,

In the presence of paramapoojya jagadguru
SRI SRI SRI NIRMALANANDANATHAMAHASWAMIJI

And

Under the guidance of our beloved Principal,
DR. SHIVARAMU M G,

It brings me great pleasure to present the current issue
of our departmental newsletter, "**ANATOMICA-AIMS**".



I would like to take this opportunity to wish our exam going students of 2015-16 batch who are appearing for the RGUHS final examination all the very best. I have full faith in their abilities and I'm confident that they will surpass the pass percentage record set by the previous batch.

I would also like to thank our editorial team for their tireless efforts, who inspite of their numerous academic and other extracurricular activities, have ensured timely editing and publishing of this edition of the departmental newsletter.



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Comparative Study of Length of Tendocalcaneus (Tendo-achilles) with Length of Lower Limb of both Sexes in South Indian Population

INTRODUCTION

Tendo calcaneus is a strong tendon in human & about 15 cm long. It is a conjoint tendon insertion of triceps surae, acts as prime mover of plantar flexion of foot at ankle joint. The length of TC in human is about 65% of total muscle length.² These length values are of western or European population but the exact length of TC in South Indian population is still unclear. Apart from regional or ethnic significance TC has surgical importance. Hence length of TC was correlated with length of inferior extremities. Rupture of TC quite common during running, jumping as it causes sudden forceful stretch of TC.

MATERIAL & METHODS

Forty nine non pathological cadavers (39 males & 10 females) preserved in dissection theatre at AIMS, B.G Nagar was dissected, the length of lower limbs were measured from anterior superior iliac spine to lateral Malleolus. TC is measured from musculotendoneous junction to insertion. The measurements were taken in cms by measuring tape (tailors tape). This study is carried out for a period of three years. Statistically t test is applied to compare the two given samples and correlated with co-efficient equation.

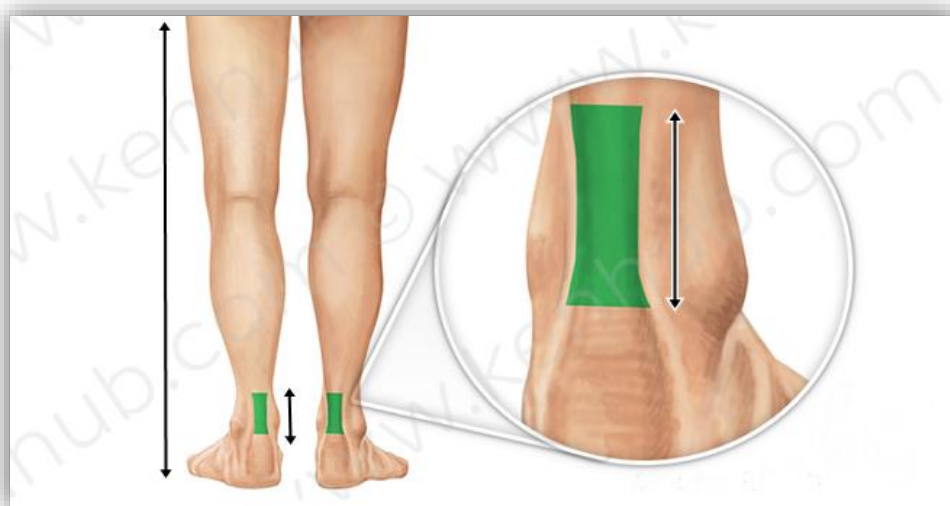
OBSERVATIONS AND RESULTS

Total 49 (39 male and 10 female) non pathological cadavers were dissected and studied. The length of tendo calcaneus was compared with respective lower limb in males. The mean value of right lower limb length was 83.28 (± 3.58 value & length of tendo calcaneus was 20 cm (± 1) + t test was 4.75 & length of left lower limb 82.17 cm (± 3.55) & mean value of length of tendo calcaneus was 15.13 (± 0.69) t test was 3.77 p value both limbs were highly significant ($p < 0.01$). In females mean value of length of right lower limb was 79.15 cm (± 2.26) & length of tendo calcaneus was 18.62 cm (± 2.30) t test value was 3.30 & length of left lower limb mean value was 79.1 cm (± 2.05) & length of tendo calcaneus was 14.79 cm (± 0.64) t test value was 2.77 p value of both lower limbs of female were highly significant ($p < 0.01$). The measurements were taken by measuring (tailors) tape. This study will be useful for anthropologist, medico-legal expert to note these values of South Indian populations. Above all to the surgeon during grafting of tendo calcaneus rupture. By knowing the length of lower limb, he can explore the length of tendo calcaneus and it will be ease for him to take the same length of muscular tissue from other parts of the body to graft or repair the ruptured tendon.



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DEFINITION & STRUCTURE

The human cornea is the anterior transparent bulging part of the outer coat of the eyeball. This refractile media of the eye alter the light path to focus it on the retina. It is avascular, with no recognizable lymphatics and cornea is not of uniform thickness. Microscopically, the human cornea consists of 5 layers. Antero-Posteriorly, these layers are 1. Corneal epithelium. 2. Anterior limiting lamina (Bowman's membrane). 3. Substantia propria (Corneal Stroma). 4. Posterior limiting lamina (Descemet's membrane) and 5. Corneal endothelium.

DISCOVERY

In a report published in the academic journal of ophthalmology (May-2013) Researchers revealed that they have identified a new layer of tissue in the human cornea named Dua's layer after professor Harminder Dua, M.D PhD an Indian born Sikh doctor from the university of Nottingham in the U.K who, discovered it. This previously undetected 6th layer of the cornea located between the corneal stroma and Descemet's membrane. This discovery was widely covered by the world's scientific and lay media. After the publication of his work, he also presented his findings at several international conferences, where it was received an enthusiastic response from specialists, in the field of corneal Transplantation. Based on the discovery of Dua, many research programmes are going on including Dr. Agarwal's eye hospital and research centre, Chennai.



Dr. Harminder Dua

In the process of separating the corneal layers surgeons generally inject tiny air bubbles (Big bubble Technique) into the cornea leading to the formation of bubbles between its layers (Pneumodissection) while performing corneal transplants. Dua had certain doubts about the plane at which the air is injected in the cornea separating the Descemet's layers. He investigated his doubts using human eyes donated for research from UK eye banks and was able to demonstrate through Electron microscopy, the existence of the new layer and its unique structure.



This breakthrough discovery by Professor Dua and colleagues sheds new light on the basic anatomy of Dua's layer, a new layer of the human cornea. This previously undetected sixth layer of the human cornea is located between the corneal stroma (substantia propria) and posterior limiting lamina (Descemet's membrane). While the entire cornea is around 550 microns (0.5mm) in thickness, the new layer is just around 15 microns thick (10.15 ± 3.6 microns). This well defined, thick acellular layer has proved incredibly strong & tough; consisting of 5 to 8 thin lamellae, predominantly type I collagen bundles arranged in transverse, longitudinal & oblique direction.

Harminder Dua exclaimed "I am pleased by my discovery as it explains a few things that were happening during lamellar corneal surgery that we did not previously understand. It will make the operation safer & may also improve our understanding of some corneal diseases". It may be possible to use the plane between the Dua's layer and corneal stroma to generate tissue for endothelial transplant.



Dr. M. Surendra
Professor

The author also proposes that the discovery will aid in the understanding of corneal biomechanics and pathology.

Patients with acute hydrops, descemetocoele & pre-descemet's dystrophy are most likely to benefit from the discovery. Dr. Dua also pointed out this new layer of cornea contributes a major proportion to the structure of the trabecular meshwork (Spaces of Fontana) at Limbus.

The Aqueous fluid drains out of the eye through this sieve-like structure. Pressure within the eye is maintained by the balance between production by eye tissue called the ciliary body & drainage principally through the trabecular meshwork to the canal of Schlemm, a circular channel in the angle of the eye.

Defective change through the trabecular meshwork is an important cause of Glaucoma, a condition that leads to raised pressure in the eye that can permanently affect sight. Appropriate further research can be directed to understand the relationship of the deep layers of the cornea to Glaucoma.

Since the discovery, scientists now believe that patients with keratoconus i.e. Degenerative eye disease where the cornea bulges & becomes cone shaped, is caused by a tear in the Dua's layer. To conclude, we Indians are very proud of Professor, Harminder Dua, of our own country, born in Jalandhar of Punjab & studied medicine at Nagpur medical College before moving to the United Kingdom. Congratulations Sir, Scientists like you are the true inspiration for future generation.

Our Staff members

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The relationship between the deep fibular nerve and the dorsalis pedis artery in the anterior tarsal tunnel: a cadaveric study
(Accepted for publication in October 2016 issue of
African Journal of Anatomy)



By Rahul A Jain, 7th term student, AIMS

ABSTRACT

The aim of the study was to demonstrate the relationship between the deep fibular nerve (DFN) and the dorsalis pedis artery (DPA) in the anterior tarsal tunnel (ATT) in order to provide useful anatomical knowledge for safe surgical approaches of the foot and ankle. Forty formalin fixed lower limbs were dissected and examined. The level of bifurcation of the DFN in ATT was noted. Relationship between the DFN and DPA was examined and recorded. The location of the DFN bifurcation was within the ATT in 34 specimens (85%) and was distal to the tunnel in 5 specimens (12.5%) and in one specimen (2.5%) there was bifurcation was observed proximal to the tunnel. Three distinct types of relationship were noted between the DFN and DPA. We believe that the detailed anatomical knowledge of the DFN, DPA and ATT will help during planning the surgical approaches of foot and ankle and help in diagnosis of clinical syndromes related with peripheral nerves of the foot.

Recent Publications in the Department

1. Rajendra R, Makandar UK, Tejaswi HL. Comparative study of length of tendo-calcaneus with length of lower limb in South Indian population. International journal of contemporary surgery 2016; 3(2): 93-6.
2. Patil BG, Makandar UK, Rajendra R, Ajay N. Sexual dimorphism of lumbar vertebral canal in different ages of North Karnataka population. International journal of contemporary surgery 2016; 3(2):37-40.
3. Chandra JJ, Omprakash B, Makandar U K, Ajay N. Study of fracture of lower end of radius in different ages. International journal of contemporary surgery 2016; 3(2): 150-3.
4. Vishwakarma N, Sony BD, Makandar U K. Correlation of occipital condyles with cranial index in both sexes of Rajasthan population – A metrical study. International journal of contemporary surgery 2016; 3(2): 32-6.
5. Omprakash B, Chandra JJ, Makandar UK, Ajay N. Correlative study of length of lower limb with areas of insertion of guy rope muscles in males (Cadaveric study). International journal of contemporary surgery 2016; 3(2): 177-82.
6. Manjunath CS, Lakanathan TH. Anatomy of the clavicle and its applicability in management of clavicular fractures. International Journal of Anatomy and Research 2016; 4(1): 2069-72.

Conferences/Workshop attended by the faculty

1. Oral presentation "The relationship between the deep fibular nerve and the dorsalis pedis artery in the anterior tarsal tunnel: a cadaveric study" by Dr. Tejaswi H L in the 5th national conference organized by Society Of Clinical Anatomists on 9th and 10th April 2016.
2. Oral presentation "Evaluation Of Protégés' Satisfaction With Mentoring Relationship In Medical Education" by Dr. Tejaswi H L in the 5th national conference organized by Society Of Clinical Anatomists on 9th and 10th April 2016.

