December 2013 – No. 137





Skeletal Injuries and Orthopaedics in Ancient Egypt

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Leonardo Zamudio Villanueva First Latin American SICOT President (1926-2013)

Born in Morelia, Michoacán, Mexico, in 1926, Leonardo Zamudio came to be one of the most prestigious doctors in Mexico.

Outstanding in all stages of his life, Leonardo finished his college and medical studies with honours at the Faculty of Medicine, *Universidad Autonoma de Mexico*, and continued his training in Santa Rosa Hospital

and Robert B. Green Memorial Hospital in San Antonio, Texas, United States. Later on, he was Chief of Service at Escandon Hospital, Conde de Valenciana Hospital and *Hospital Español de Mexico*.

His professional life has been long, productive and very successful, with an extensive curriculum. He belonged to 19 national and international societies and received more than 18 national and international distinctions awarded by the academies and societies with whom he enthusiastically collaborated.

He authored more than 114 scientific publications in national and international journals. He was also author and editor of several books on orthopaedics and translator of more than 20 books and magazines related to orthopaedics. He also ventured into the realms of literature and successfully edited 13 books with poems, humour, love, medical and political anecdotes, making his writing very enjoyable.

As a teacher, he collaborated in pre- and postgraduate studies, with the main universities of Mexico, and inspired great generations of orthopaedic surgeons.

In order to support young orthopaedic surgeons to find where to update their knowledge, he founded and funded the Metropolitan Library of Orthopaedics and Traumatology, which contains a considerable stock of books and worldwide publications.

Again, on behalf of the new generations, as President of the XI SLAOT Congress (Latin American Society of Orthopaedics and Traumatology), he initiated the sponsorship of numerous fellowships for young surgeons, which are still awarded. In addition to these, he also



personally sponsored 52 fellowships, 20 international for countries such as India, England, China, Chile, Bulgaria, Belgium, Serbia, Iran, Spain, Argentina, and also for Mexican nurses and students.

His talents as a great organiser and administrator, and for his unique responsibility, led to his election to several

major positions in national and international societies.

In 1990, due to his active participation in SICOT since 1960, he achieved the presidency, becoming the first Latin American orthopaedic surgeon to be distinguished with this honourable position, which is of enormous pride for the Latin American Orthopaedic Community. During his presidency he paid close attention to a balanced representation of all parts of the world within SICOT especially from the less developed countries. He encouraged the rapprochement, through the scientific congress, of what was called at that time the East and West countries. He contributed to the development of the SICOT Education Programmes and personally sponsored the Pilar Zamudio Fellowship devoted only to female orthopaedic surgeons. Very humble and human, he would not tolerate conceited behaviour.

Over and above his professional successes, as a man of faith and incredible social conscience, he personally assisted world missions to eradicate Polio in the globe, and dedicated many hours of his life to the treatment of Hansonian (leprosy) patients.

A strong supporter and promoter of SICOT, he believed SICOT's true essence (very different from other international societies) proposed not only science and innovative techniques, but a rich and deep knowledge of real medicine around the world, the great experience of getting to know not only extraordinary doctors but also outstanding humans eager to establish real bridges of understanding and long lasting friendships between them and their countries.

Leonardo Zamudio... a man to remember!



CME is not only a duty but also a right to claim

Jochen Eulert SICOT Secretary General – Würzburg, Germany

In almost all countries, society demands continuous medical education and training from the individual doctor and worldwide it is seen as his essential duty. Many, if not all, areas of society look for a well-trained and experienced doctor:

- Governments require the best treatment for citizens/voters;
- Insurance companies require the best treatment for their clients;
- Hospitals/employers require well-trained surgeons to have full beds;
- Industry requires doctors who are capable of using their instruments properly;
- CME authorities require continuous education/ training;
- And require re-certification for established doctors.

Above all (and he is absolutely right):

• The patient requires safety and wants to be treated by a well-trained surgeon.

But this duty cannot be left to the doctor's discretion alone considering it as some kind of private activity. Continuous education must not be a one-way road where the doctors undertake learning and teaching by offering their time and financial resources whilst society reaps all the benefits. Society and in particular the different players in the health care systems also have some responsibility in this process by setting up acceptable conditions to allow the individual doctor to obtain the education and training he or she needs to treat his or her patients properly under modern conditions.

Congresses and courses represent an ideal platform to offer the necessary scientific information and educational tools. The following conditions should therefore be provided by society:

- 10 days' leave per year to attend congresses and courses;
- Financial support from the employer;
- Financial support (educational grants) from industry through national or international societies (vs. compliance);
- Costs to be allowable against income tax.

Postgraduate education and training is not only a duty but should also be recognised as a right that every doctor should demand to be educated to the level of knowledge and skills needed to provide ideal patient care.

SICOT, together with national and international orthopaedic societies, should start a worldwide campaign to defend this right throughout every corner of the globe.



SICOT Orthopaedic World Congress in Hyderabad – All sessions were well-attended



Skeletal Injuries and Orthopaedics in Ancient Egypt

Galal Zaki Said SICOT Distinguished Member – Assiut, Egypt

Egypt had professional doctors as early as the old kingdom, five thousand years ago. There were also specialists in different branches of medicine. Homer c. 800 B.C. remarked in the Odyssey: "In Egypt, the men are more skilled in medicine than any of human kind". Hippocrates, Herophilos, Erasistratus and later Galen studied at the temple of Amenhotep, and acknowledged the contribution of ancient Egyptian medicine to Greek medicine.

Mummified bodies, skeletal remains and wall paintings have shown us some of the ancient orthopaedic practices. There are many examples of excellently handled fractures of the long bones that had united in perfect alignment. Fractures were treated by splinting with pieces of bark or wood padded with linen. This is particularly impressive in a case of oblique fracture of the femur in an adult, which united without any over-riding (Figure 1).



Figure 1: Fractures of long bones which have united in perfect alignment. Note also oblique fracture of the femur which has united without any overlap

Joint dislocations are depicted in Ipuy's tomb, Ramses II's sculptor, by which a person is setting the shoulder of a

prostrate workman, which is similar to the method devised by Kocher for reducing dislocated shoulders, three thousand years later (Figure 2).



Figure 2: Painting from Ipuy's tomb in Thebes. A person is setting the shoulder of a prostrate workman

Probably the oldest medical document ever written is the Edwin Smith surgical papyrus. The papyrus is a copy of an original which dates to about the 30th century B.C., the time of pyramid building. In this papyrus, forty-eight cases, mostly injuries, were described free from any magic. Descriptions of the patients and their treatment were detailed systematically starting with wounds of the scalp, fracture of the skull exposing the brain, fractures of the neck with paralysis of the arms and legs, fractures of the collarbone and moving down to the extremities. The author, commonly believed to be Imhotep, instructs the treating physician first to listen to the patient's complaint and then to examine him using his eyes and hands. After reaching a diagnosis he makes a declaration: an ailment which I would treat, an ailment which I would contend and an ailment which I would not treat. This formal, structured and logical approach is the basis of our current approach to the patient. Two examples of these cases are cited here:

 Case 31: Traumatic quadriplegia: "If you examine a man having dislocation in a vertebra of his neck, should you find him unconscious of his two arms and his two legs, while his phallus is erected... and urine drops from his member without his knowing it..." "...it is a dislocation of a vertebra of neck extending to his backbone..., an ailment for which nothing is done".

 Case 35: Fracture of the clavicle: "If you treat a man for a break in his collarbone and you find his collarbone shortened and out of alignment with respect to its companion, an ailment I will treat. Place him prostrate on his back with something folded between his shoulder blades; you should spread out with his two shoulders to stretch apart his collarbone until break falls in its place".

The ancient Egyptian surgeon has evidently practised autopsy. They describe a case of closed fracture dislocation of the cervical spine as a vertebra "sinking into the interior of the neck as the foot settles in cultivated soil", where one vertebra is said to "penetrate into the other". He could distinguish between fractures and luxations by crepitus, and defined sprain as "rending of two membranes although each is still in its place".

Infected open fractures with fever were considered grave injuries. The favourite dressing of the wound in the first day was fresh meat (haemostatic). In the following days a dressing of honey (hygroscopic) and oil (to prevent sticking of the dressing) was used unless it was feared it would interfere with drainage. The application of mouldy bread was also practised (in modern days, penicillin was first extracted from moulds).



Figure 3: Skeleton of achondroplasic dwarf, from Hierakonpolis, Upper Egypt

Several cases of tuberculosis of the spine were reported as early as the predynastic time. The most authenticated case is that described in Nesparehan, a priest of Amun. It shows the typical collapse of a dorsal vertebra with angular kyphosis and a big psoas abscess in the right iliac fossa (Figure 4).



Figure 4: Nesparehan: a priest of Amun, 21st dynasty: Pott's disease of the spine with typical deformity and a big right psoas abscess

Several examples of congenital anomalies, deformities and hormonal disturbances are present in Ancient Egyptian history. Seneb is a typical example of an achondroplasic dwarf in the 19th dynasty. He held important priesthoods in addition to being overseer of weaving of the palace. Other dwarfs were employed as personal attendants and entertainers. In addition, skeletons of two achondroplasic dwarfs were found in a necropolis of Hierakonpolis in Upper Egypt (Figure 3).

A case of severe bilateral clubfeet is depicted in a Middle Kingdom tomb of Baqt in Beni Hassan. The word *djeneb* meaning "crooked" is written above it. A recent CT scan of the feet of Tutankhamun, the golden Pharaoh of the 18th dynasty, revealed that he suffered from severe varus deformity of his left foot which was also appreciably short (Figure 5). This is probably why the Pharaoh was sometimes depicted using a walking stick.



Figure 5: CT scan of Tutankhamun's feet showing shorter left foot, the seat of varus deformity

The Queen of Punt in a bas relief from the temple of Queen Hatshepsut in Dair El Bahari (18th dynasty) raises a diagnostic problem. She is excessively obese, with exaggerated lumbar lordosis, suggesting spondyloptosis or bilateral congenital dislocation of hips.

Poliomyelitis was also known at that time as shown in some paintings and sculptures of a doorkeeper, where his leg is wasted, shortened, with an equinous foot and a walking aid is used.

Probably the oldest known prosthesis is that replacing the right big toe in a mummy of a woman found in excavations at the necropolis of Thebes (Figure 6).

Surgery was evidently advanced in Egypt at the end of the dynastic era as shown by the elaborate surgical instruments engraved in a panel in Kom Ombo Temple (180-47 B.C.) (Figure 7). Two cases of successful amputations, one of arm and the other of leg, were recorded in the literature suggesting the use of the bone saw.

We might never fully grasp the medical and surgical advancement of Ancient Egypt, yet these paintings and sculptures open our imagination to the possible state of Orthopaedics thousands of years ago...



Figure 6: Prosthesis of the right big toe made of wood and leather



Figure 7: Surgical instruments from Kom Ombo Temple: knives, drill, saw, forceps or pincers, censer, hooks, etc.

International Orthopaedics – © Springer-Verlag Berlin Heidelberg 2013 10.1007/s00264-013-2183-z – Published online: 17 November 2013



Orthopaedic Training in Saudi Arabia

Mohammed Alshehri Jeddah, Saudi Arabia

The orthopaedic training in Saudi Arabia is a long and mostly exciting trip. It has some similarities to the orthopaedic training system in North America.

Undergraduate medical training in Saudi Arabia consists of six years in medical school. After this, each medical student needs to spend one year of internship rotating between the four major specialties. During the year of rotating internship, everyone has to pass the entrance exam for training programmes for medical specialties, which is considered as a medical license exam. Once the internship has been successfully completed, the candidate can apply for a residency position in his/her specialty of interest service.

The orthopaedic training programme is a unified programme at the State level and supervised by the Saudi commission for health specialties. It is a joint training between the approved medical centres in each region managed by a local committee.

There are three prerequisites to be eligible for orthopaedic training. The first one is obtaining approval from the workplace to join the training programme in orthopaedic surgery. This is followed by the submission of an application letter to the Saudi commission for health specialties. Finally, the candidate needs to pass the selection exam. This exam is unified all over the Saudi Kingdom and also includes an interview organised by the local committee. Having successfully gone through all the prerequisites, the applicant can start his journey in orthopaedic training, which lasts for five years.

The first year is a mix between orthopaedic and nonorthopaedic specialties. Every trainee has to spend a period of three months in each of the intensive care, general surgery, plastic surgery and orthopaedic surgery units. The aim of training in the first year is to provide residents with basic surgical skills and expose them to surgical subspecialties that an orthopaedic surgeon needs to be familiar with.

The second and third years form multiple "three-month junior residency rotations" in various orthopaedic

subspecialties at an approved training centre. The residents act at first on call during these years. They develop confidence in managing diverse emergency situations and are provided with hands-on supervised training in most of the orthopaedic trauma procedures.

In the fourth and fifth years of training, the trainee is addressed as a "senior resident". Aims of senior residency are to expose residents to all the diverse fields of orthopaedic surgery and allow them to participate in major elective orthopaedic procedures.

Annual promotion depends on yearly performance as assessed by the preceptors. In addition, each trainee needs to pass both clinical and written promotion exams that are conducted yearly. Promotion from third year to fourth year involves passing part 1 of the Board examination. Of late, the fourth year of residency training has increasingly involved research commitments in a field of interest of the residents. Advanced Trauma Life Support certification is mandatory for all trainees and this has to be taken once during the five years of training.

In all approved training centres, the trainee has to attend the daily morning meetings. There are fixed academic half days every week for all trainees in each city. These are highly organised with a fixed schedule of lectures, case presentations, and journal club presentations. Individual centres also run their own academic activity each week.

The Saudi orthopaedic training provides excellent handson training in trauma. Exposure to other subspecialties is variable and highly depends on the centre and the interests of the preceptors at that centre.

At the end of the fifth year eligible candidates sit for board examinations, which are held at least once per year in one training centre for trainees all over the country. The final examination consists of two parts: the written part and clinical/oral part. Candidates who pass the final examination are granted the Saudi Board Certificate in orthopaedic surgery. Most graduate orthopaedic surgeons apply for subspecialty fellowships outside the Kingdom in Europe or North America. *(continued on page 11)*



Hiranandani Orthopaedic Medical Education (HOME) Research Fellowship Report

Chintan R. Hegde SICOT Associate Member – Mumbai, India

While I was pursuing my trauma training at a renowned centre in Mumbai, India, I realized that it was time for me to set my goals right and decide on my specialty in the ever growing field of orthopaedic surgery. As all young aspiring orthopaedic surgeons, I too was attracted towards Arthroplasty surgeries from the beginning of my postgraduate training.

I had heard about Hiranandani Orthopaedic Medical Education (HOME), a research division of the Department of Orthopaedics at the Dr L.H. Hiranandani Hospital in Mumbai, India, through colleagues and through reading about the amount of research work coming out of this department under the supreme leadership of Dr Vijay D. Shetty, a renowned hip and knee surgeon, and a dedicated academic with a great inclination for research. I knew this was the perfect place for me to observe specialised hip and knee surgeries, learn the ins and outs of research and to improve my orthopaedic skills in every aspect.

Clinical Work

I joined HOME as a Clinical Research Fellow for a period of one year from 1 February 2012 to 1 February 2013, and Dr Vijay D. Shetty was my mentor. He takes a keen interest in nurturing new talent and shows them the right direction for the future. He took me through the basics of research, the quality and type of work being done at this centre. I was handed a crystal clear job format of this one-year fellowship on day one.

Dr Shetty made me in charge of two projects and guided me through each and every step of publishing these projects. Both projects have been accepted and published in an international journal. Another good part of this fellowship is that, apart from active research work, it also involves clinical work including operating as a first assistant.

I got to see both cruciate substituting and cruciate retaining type of knee surgeries, knee arthroscopic surgeries, advanced hip reconstruction surgeries and a variety of trauma cases in this period of one year. I also

had the opportunity to be trained in Computer Assisted (Navigation) Knee surgeries.



IBOM team with Dr Vijay Shetty

During my tenure as a fellow, I was actively involved in the first ever IBOM (International Biologic Orthopaedic Meet) held under the guidance of Dr Shetty in Mumbai, India, in the month of April. We had eminent international and national faculty attending this meeting.

Then came the SICOT Instructional Course lectures, organised by Dr Shetty and Dr Ashok Johari at the Dr L.H. Hiranandani Hospital. I was actively involved in the organising and scientific committee.



With Dr Sanjeev Jain at CAD-2012

The HOME department also organised the CAD-2012 challenges and debates in complex arthroplasty under the guidance of Dr Sanjeev Jain, a renowned joint replacement surgeon.

I had the opportunity to attend the JBJS (British) Indian reviewers' meeting at Chennai, India, and to meet editors of this reputed journal. It helped me understand the objectives and functioning of the journal. I also attended two primary total knee replacement workshops during my fellowship.

Outside Clinical Work, Travelling & Recreation



Dr Shetty and me with the Vice-President of the Seychelles

I also had an opportunity to accompany Dr Shetty to the Mahe Islands, Seychelles, for a knee replacement mission in the month of August, where we successfully performed 28 total knee replacements in three and a half days, which is a record by itself and was well appreciated by the Seychelles government. During our one-week stay at the Seychelles, we engaged ourselves into some adventure activities too, such as deep-sea diving. This truly was my best experience until now and I sincerely thank Dr Shetty for giving me this opportunity of a lifetime.

I also had the chance to travel to Dubai, United Arab Emirates, for the Combined 33rd SICOT & 17th PAOA Orthopaedic World Conference to present my work on an international stage. I also travelled to many places in India to present our work at various international and national meetings held here during the last year.



All ready for our first dive

I wholeheartedly thank my guide, Dr Vijay Shetty, who, apart from being a highly competent surgeon, is also extremely considerate and helpful. He is a very good teacher and an excellent guide. I sincerely thank him and Dr Sanjeev Jain for being such great hosts. The experience and knowledge I have gained from this fellowship has changed my outlook towards orthopaedic practice and research in particular. I strongly recommend this fellowship to all young surgeons who wish to learn and make an active contribution to orthopaedic research.

I was awarded the Clinical Research Fellowship in Advanced Hip & Knee Surgery on 31 January 2013 by the Department of Orthopaedics at HOME.



Dr Y. Gawai, Dr Sanjeev Jain and Dr Vijay Shetty awarding me the certificate of the HOME fellowship



Women in Orthopaedics

Ratna Johari Maheshwari SICOT Young Surgeons Committee Member (Women's Subcommittee) – Jamnagar, India

It was just over 150 years ago that Elizabeth Blackwell, a determined young girl, became the first American woman to gain admission to medical school. She did so in spite of popular prevailing theories of those times which proclaimed that women seeking education in medicine would develop "monstrous brains and puny bodies and abnormally weak digestion". When she entered the class on her first day a death-like stillness prevailed, as if each member had been stricken with paralysis. It is due to trail blazing women like these, who showed unflagging zest in the face of hostility, that we owe the numerous women in the medical profession. Today, women constitute around 50% of an average class in medical school. However, orthopaedics has the lowest percentage of women in a surgical specialty, with only 4.3% of board certified orthopaedic surgeons being female according to the United States data.

The history of world orthopaedics has been highlighted by the work of women. It was as early as 1924 when Maud Forrester Brown, Britain's first woman orthopaedist, started orthopaedic services in the south-west country at the Bath and Wessex Orthopaedic Hospital, under the guidance of Sir Robert Jones. She went on to establish a complete chain of children's orthopaedic clinics throughout Somerset, Wiltshire and Dorset. In spite of the ignorance she had to face, she brought boundless energy. Miss Forrester was a member, and later emeritus member, of SICOT. The Journal of Bone and Joint Surgery in 1970 carried an article on her "In Memoriam" marking her death at the age of 84. Ruth Jackson, on the other hand, was the first practising female orthopaedist in the United States. She discovered the rewards of orthopaedics while working with polio patients. In 1932, she opened her office in Dallas, Texas. The following year the American Academy of Orthopaedic Surgeons (AAOS) was founded. All who practised orthopaedics were allowed to join, except her. Undaunted, she took and passed the board exams, becoming the first woman admitted to AAOS. She went on to become an authority on cervical spinal injuries, on which she had extensive publications.

In spite of an illustrious history, few women have entered the field of orthopaedics. Limited exposure to musculoskeletal topics in medical school and a lack of role models have been identified as contributory factors. A recently published article "A profile of female academic orthopaedic surgeons" in Current Orthopaedic Practice (issue 6) of the year 2013 was based on a survey including questions on demographics, training and education, practice components, mentorship and career satisfaction. The study, including 164 female orthopaedic surgeons, revealed that having a mentor positively influenced their career choice. Potential barriers to academic advancement which were identified included gender stereotype, department politics, and guilt about family obligations or family expectations. The study also revealed that 62% of female faculty members had at least one child and 73% were married or in a domestic relationship. The study concluded that in spite of a high satisfaction rate with their career choices and despite all of their successes, barriers to female academic advancement are still perceived.

The stereotypical image of an orthopaedic surgeon as being burly, using brute force to manually cut into bones, is a thing of the past. Orthopaedics today is revolutionised with the use of power instruments and also boasts of delicate subspecialties. It is a field that requires manual dexterity and three-dimensional visualisation. Having more women be a part of orthopaedics is in the best interest of the specialty itself. For any specialty to progress or discover new technologies, it is imperative that it attracts brilliant minds, be it a man or a woman. The hope for any specialty is to snag the best and the brightest. Hence it becomes important that women genuinely interested in pursuing orthopaedics should not be discouraged. Efforts must be taken to eliminate unintended barriers. At the same time, diversity in caregiving and changes in perspectives are ultimately beneficial to patients in general.

In the issues to come we interview leading women orthopaedists around the world, to dispel common myths of not having enough time to have a family and other lifestyle issues associated with orthopaedics in general. This will guide the young surgeons about the pros and cons of a rewarding career in this field.

Painful hip after Hemiarthroplasty

Syah Bahari & Tom McCarthy Dublin, Ireland

History

A 69-year-old male presented to the Emergency Department complaining of progressive pain in the left hip. He was able to mobilise using the walking frame. He denies any history of fall. He recently had a bipolar hip hemiarthroplasty for intracapsular neck of femur fracture 6 months earlier. He also has a background history of Parkinson's disease, osteoporosis, hypertension and depression.

On examination, he was able to weight bear on the left leg but it was painful. Passive movement of the left hip was also painful. He had no temperature and his WBC, ESR and CRP was normal.

A radiograph of the pelvis was performed.

Q. What are your thoughts on the pelvic radiograph?

To read more, please visit the SICOT website (accessible to SICOT Members only and login is required): www.sicot.org/?id_page=808

Training Around the World (continued from page 7)

The biggest strength of orthopaedic training in Saudi Arabia is its organisation as a joint programme between approved medical centres in a region. This ensures reasonable exposure of the trainees to different surgeons and various subspecialties. The biggest weakness of the programme is lack of standardisation in the residency programme and higher stress on "service" rather than "education". Surgical hands-on training is highly limited in elective surgeries and teaching of surgical skills to residents is not taken as a responsibility by many consultant surgeons.

Orthopaedic training in Saudi Arabia is evolving and there continues to be a lot of scope for improvement. We need to promote academic leaders who are willing not only to do research, but also highly dedicated to resident training. The newer generation of orthopaedic surgeons is increasingly trained in western countries, and has brought the latest innovations and technology to the field of orthopaedics in the Saudi Kingdom. The need of the hour is for some basic educational reforms, which will make sure that the training is comparable to the western world, with an eventual aim of building a better system for health and academic services in the Kingdom.





XXVI SICOT Triennial World Congress combined with the 46th SBOT Annual Meeting Rio de Janeiro, Brazil – 19-22 November 2014

Abstract submission is open on the SICOT website!

Main topics:

Arthroscopy & Sports Medicine Clubfoot (International Clubfoot Congress) Conservative Treatment Developing World Disaster Management Foot & Ankle Hand Hip Information Technology Knee Minimally Invasive Surgery Orthopaedic Oncology Osteoarticular Infections Osteoporosis Paediatrics Pain Management Prosthetics & Orthotics Quality of Life Issues Research Rheumatology Shoulder & Elbow Spine Trauma

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