

1978 *The beginning...*

Ganga Hospital was founded in the year 1978 by Dr.J.G.Shanmuganathan and Mrs. Kanakavalli Shanmuganathan. Due to the dedicated work of Dr.J.G.Shanmuganathan and administrative skills of Mrs. Kanakavalli Shanmuganathan, the hospital grew steadily over the years. In 1991, Ganga Hospital was converted into a speciality centre for Trauma, Orthopaedics, Spine, Plastic and Micro Vascular surgery, following the return of their sons Dr. S.Rajasabapathy and Dr.S.Rajasekaran who had completed their speciality training abroad.

Soon, a highly skilled and dedicated team of Orthopaedic, Plastic and Anaesthesiologists was formed, which made the hospital a reputed and preferred centre for Trauma, Orthopaedics and Plastic Surgery.

1978	:	**THE JOURNEY BEGAN...**
1978	:	Ganga Hospital started as a 17 bed Poly Clinic.
August 1991	:	Establishment of Shanmuganathan Kanakavalli Super Speciality Centre for Trauma, Orthopaedics & Plastic Surgery. Expanded to 45 beds with 2 new Operating Theatres
Sept. 1991	:	First replant of amputated hand
January 1992	:	First major spinal deformity correction
February 1992	:	First free flap of major open injury
March 1992	:	First total joint replacement done
January 1993	:	Establishment of micro surgical facilities for spine surgery
August 1994	:	First International Course on Spine Surgery with live demonstration of surgeries
June 1995	:	Basic Nursing Course - Approved by the Department of Human Resource Development, Govt. of Tamil Nadu
January 1997	:	Recognized for DNB in Orthopaedic Surgery, National Board of Examinations
June 1997	:	"Helpline Project" in association with Coimbatore City Round Table 31
August 1997	:	Expansion with construction of New Block to include four new Operating Theatres, Spacious Outpatient Department, Trauma ICU, Library and Physiotherapy Department. Total bed strength increases to 110
January 1999	:	Recognized by World Orthopaedic Concern (WOC) for Inland Training Fellowships
May 2000	:	Establishment of 'Ganga Micro Surgical Training Institute'
June 2000	:	Recognized for Super-Speciality Fellowship in Spine Surgery by the National Board
August 2000	:	"Save the Working Hand Project" Matching Grant Programme of Rotary Metropolis.
January 2001	:	Ganga Trauma Fellowships
June 2001	:	Diploma in Trauma Nursing
July 2001	:	Accident Helpline Centre established at Tirupur
June 2002	:	"Ganga Johnson & Johnson Fellowships" - instituted for Spine and Hand Surgery
August 2002	:	Establishment of Ganga Hospital Blood Bank
Nov. 2002	:	Bruce Bailey Fellowship
Dec. 2002	:	Ganga Charitable Trust for Orthopaedic Research and Education
January 2003	:	"Ganga Hospital Carl - Zeiss Fellowship" in Microsurgery.
January 2003	:	Ganga Hospital Silicon Prosthetic Centre for cosmetic finger prosthesis
March 2003	:	7th floor expansion. Total bed strength : 130

GANGA HOSPITAL



2003 *The journey continues...*

Ganga Hospital's steady progress over the years is the direct result of the confidence and goodwill of patients and the support of numerous referring doctors. With the grace of the Almighty, Ganga Hospital will continue to serve society in a greater measure in the years to come.

Department of Orthopaedic Surgery

Staff

The Department's strength lies in its staff who have strived to be the best in their fields through constant training and upgrading of skills. The guiding philosophy has been to achieve the best clinical results for patients by individual excellence and collective teamwork and to strictly adhere to medical ethics and values.

The department is well staffed with 3 consultants, 1 senior registrar, 1 registrar, 2 spine fellows, 2 trauma fellows, 3 tutors in orthopaedic surgery and 6 postgraduates.

The unit is headed by **Dr.S.Rajasekaran**. He was the best outgoing student of Coimbatore Medical College and stood first in the University of Madras in the orthopaedic post graduate examinations. He completed FRCS in Edinburgh and topped the University of Liverpool in the M.Ch orthopaedic examinations, winning both the University Medals. He has a PhD in Spinal Tuberculosis. For this work he was awarded the **'Tamil Nadu Scientists Award'** by the Government of Tamil Nadu, the prestigious **Dr. B.C. Roy Silver Jubilee Award** for original research work by the Medical Council of India for the year 2002 and the **'Sofamar Danek Award'** of the International Society for the Study of Lumbar Spine, Canada.



Dr.S.Rajasekaran
M.S. (Ortho)., Dip. NB (Ortho)., F.R.C.S.(Ed)., M.Ch (Liverpool)., Ph.D.

Current Positions

President Elect of 'World Orthopaedic Concern', UK
Regional Member Representative for West Asia of the 'Asia Pacific Orthopaedic Association'
Chairman, Trauma Section of the Asia Pacific Orthopaedic Association
Secretary, Association of Spine Surgeons of India
Executive Committee Member, Tamil Nadu Orthopaedic Association
Deputy Editor, SPINE, Indian Edition
President, Association of British Scholars, Coimbatore

Special Interests

Spine Surgery
Trauma and
Orthopaedic Research

•Strengthened by skills
•Powered by team work
•Guided by values



Dr. J.Dheenadhayalan
M.S. (Ortho)

Dr. J.Dheenadhayalan joined the department in 1992 and became a **Consultant** in 1998. He had his basic orthopaedic training at Mysore, followed by advanced training at Nuffield Orthopaedic Centre, U.K. and a fellowship in Joint Replacement Surgery in Germany. He has been the Organising Secretary of International Conferences on Spine Surgery in 1994, 1996 and 2000, of the Indo German Orthopaedic Foundation Meeting, 1999 and of the International Knee Course, 2001. He is also one of the Executive Committee Members of the World Orthopaedic Concern International.

Special Interests: Trauma, Shoulder and Joint Replacement Surgery



Dr. Ajoy Prasad Shetty
M.S. (Ortho)., D.NB (Ortho)

Dr. Ajoy Prasad Shetty joined the department in 1994 and became a **Consultant** in 2000. He had his basic orthopaedic training at Bangalore followed by advanced training in Spine Surgery at Adelaide, Australia. He was the Organising Secretary for many International Workshops on Spine Surgery and for the periodic Instructional Courses on Spine held on the subjects of low back pain and spinal deformities. He won the Prof T.K. Shanmugasundaram Gold Medal of Tamil Nadu Orthopaedic Association in 1995 for his presentation on 'Monomelic Polytrauma'. He is also the recipient of the Japanese Orthopaedic Association Traveling Fellowship Award for 2003.

Special Interests: Trauma and Spine Surgery.



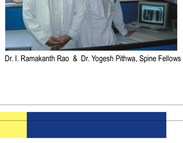
Dr. S.R.Sundararajan
M.S. (Ortho)

Dr. S.R.Sundararajan joined the department in 1995 and became a **Senior Registrar** in 2001. His special interests are Trauma, Arthroscopy and Knee Surgery and he has been undergoing Advanced Training in Arthroscopy at Flinders Medical Centre, Australia since July 2002. He will rejoin the unit in June 2003.

Spine Fellows

In 2000, the department became the first unit in the country to be recognized by the National Board of Examinations, New Delhi, for super-speciality training in Spine Surgery. The fellows are selected by an All India Entrance Exam conducted by the National Board and the two year course is open to both Orthopaedic and Neuro surgeons. The fellows have both clinical and research tasks, along with the responsibility for maintaining accurate and systematic documentation of clinical cases. Participation in teaching programmes, presentation of the department's work at scientific fora and clinical research work leading to national and international publications, are also a part of the curriculum. In the second year, hands-on surgical training is offered under supervision and guidance.

Dr. I Ramakanth Rao was the recipient of the Asia Pacific Orthopaedic Association Traveling Spine Fellowship



Dr. I. Ramakanth Rao & Dr. Yogesh Pithwa, Spine Fellows

Trauma Fellows

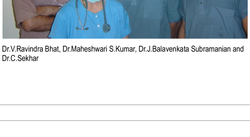
The Trauma Fellows are primarily responsible for accurate documentation and record maintenance of the large number of trauma patients. The fellows are exposed to more than 3500 major limb trauma every year and participate actively in ward management & surgical treatment of these patients. The 1year trauma fellowship receives ample funding and has enabled important research on various management options in the fields of open injuries of limbs, general trauma and interlocking nails since 1995.



Dr. B.C. Bhanu Prakash & Dr. J. Naresh Babu, Trauma Fellows

Department of Anaesthesia

The department of anaesthesia offers round-the-clock comprehensive peri-operative care for all patients and forms the backbone of the unit. **Dr. V.Ravindra Bhat, M.D., DA, DNB**, joined as a consultant in 1993 and had his anaesthesia training in Coimbatore and Madras Medical College. He was the co-chairman of the scientific committee of ISA National Conference 2002 held at Coimbatore. **Dr.C.Sekhar, MD** had his training from KMC, Manipal and joined as a consultant in July 1995. His area of interest is anaesthesia for major spine surgeries. **Dr. J.Balavenkata Subramanian, MD, DA** had anaesthesia training from PGI, Chandigarh and BJ Medical College, Pune. He joined as a consultant in April 1995. He was the chairman of the scientific committee of ISA National Conference 2002 held at Coimbatore.
Dr. Maheshwari S. Kumar had her training at Ramachandra Medical College, Chennai and joined as registrar in 2000.



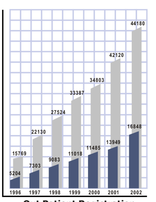
Dr.V.Ravindra Bhat, Dr.Maheshwari S.Kumar, Dr.J.Balavenkata Subramanian and Dr.C.Sekhar

Clinical Activities

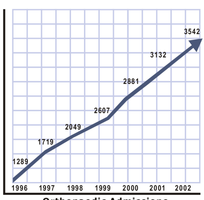
The department's activities constitute an admirable blend of high quality clinical care, focus on academics and adequate research in clinical and basic orthopaedic sciences. Despite the high clinical load, the senior staff maintain high performance standards through compulsory periodic training at leading centres around the world and participation in numerous educational meetings.

Clinical work has steadily increased every year from its inception in 1991. The total outpatient strength, which was 15,769 in 1996, increased to 42,120 in 2001. The orthopaedic inpatient strength similarly increased from 1289 in1996 to 3132 in 2001. With new inpatient registrations of 16,848 and inpatient strength of 3542 in the year 2002, the department stands as one of the largest units dedicated to the field of orthopaedic surgery in our country.

The outpatient department functions 365 days a year with continuous consultant cover. The casualty is maintained by a team of surgeons supervised by a senior registrar and consultant. A spacious outpatient department with adequate nursing staff and plaster technicians, supported by secretarial and paramedical staff allow for a high turnover of patients. Elective surgical list and emergency lists are performed every day. The department has 3 well-equipped theaters, each individually equipped with image intensifiers, Carl Zeiss operating microscopes and a complete series of instrumentation and implants for all possible spine and trauma surgery.



Out Patient Registration
New Patients Total Number of Out Patients



Orthopaedic Admissions



The Out- patient department



Clinical teaching in progress



Seminar session

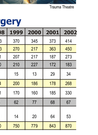
Trauma

Round-the-clock availability of an orthopaedic team skilled in all forms of trauma management, a plastic surgical team with expertise in micro surgery, operating theatres fully equipped with state of the art pre-anaesthetication and implants, the support of full-time anaesthesiologists, and highly trained nursing and paramedical staff have helped the unit to become a tertiary referral centre for trauma patients. Over 3500+ major limb injuries are treated every year, of which nearly 1500 are hand and foot trauma. The unit offers intensive care facility with provision for ventilatory support and cardio-thoracic, general and neurosurgery aces on call for patients with systemic injuries.

The team work between the departments of orthopaedics and plastic surgery has helped to set new trends in the treatment of open and mutilated injuries of the limbs. Immediate reconstruction in patients with bone and soft tissue defects have helped to improve results and reduce hospital stay and costs to patients. Many limbs which would otherwise result in amputation have been successfully saved by combined aggression of all concerned.

The rich clinical experience has led to research on various aspects of trauma management.


Intensive Care Unit


Trauma Theatre

Trauma Surgery

Trauma Surgery	1998	1999	2000	2001	2002
Interlocked Nailing	313	370	345	373	414
Plate Osteosynthesis	183	270	217	363	450
Hip Fractures	131	207	217	197	273
Major Open Injuries	179	210	227	172	183
Major Pelvic Fractures	8	15	13	29	34
Knee Injuries	174	200	188	178	268
Distal Forearm Fractures	131	170	160	160	330
Shoulder Injuries	56	82	77	68	97
Limb Reconstruction for Bone Loss	71	14	20	64	53
Miscellaneous Fractures	820	750	779	843	870


A mangled Grade IIIC open injury of the lower limb which otherwise would have been amputated, treated by vascular repair, soft tissue procedures and bone transport, resulting in a good functional result.

Research Contributions - Trauma

Immediate reconstruction of open injuries of limbs with bone and soft tissue defects

Mangled extremities with major bone and soft tissue loss are the ultimate challenge for trauma surgeons. Even in the best trauma centres in the world, reconstruction is performed in a staged fashion which increases the treatment time, the number of surgeries and the cost of treatment. The rate of infection in delayed reconstructions is also high with poor functional outcome.

The trauma team of Ganga Hospital has evolved new concepts by performing immediate one stage reconstruction of all bone and soft tissue defects. This concept has helped to reduce infection and other complications, decrease number of secondary procedures and improve the functional results. This innovative concept has earned the department much recognition and has attracted fellows from the other states in the country & abroad.


A major crush injury of the upper limb which otherwise would have resulted in amputation has been salvaged by immediate combined reconstruction enabling the patient to return back early to his normal activities


A major blast injury of the lower limb has been salvaged by combined immediate reconstruction. The patient was on his feet and returned to his agricultural work early.

Awards - International

SICOT Paper Award for presentation at the SICOT Meeting, San Diego, USA, Aug. 2002.
Topic: *Immediate Total Reconstruction of Limbs in Open Injuries*
Dr.S.Rajasekaran, Dr.S.Rajasubramaniyan, Dr.J.Dheenadhayalan and Dr.Ajoy Prasad Shetty

ORNICO - Indo-German Orthopaedic Foundation Award for Best Orthopaedic Research Presentation, Hyderabad, 1997
Topic: *How far can we go on Day One Reconstruction in Open Injuries?*
Dr.S.Rajasekaran and Dr.S.Rajasubramaniyan

Awards - National

A.K.Mehta Gold Medal for the Best Paper Presentation, Indian Orthopaedic Association- Kochi- November 1997
Topic: *Primary Total Reconstruction in Open Injuries*
Dr.S.Rajasekaran, Dr.S.Rajasubramaniyan and Dr.J.Dheenadhayalan

T.K.Shanmugasundaram Gold Medal for the Best Paper Presentation, Tamil Nadu Orthopaedic Association Conference, Madras, 1996
Topic: *Monomelic Polytrauma- Management Challenges*
Dr.Ajoy Prasad Shetty, Dr.S.Rajasekaran and Dr.S.Rajasubramaniyan

Salient Presentations on Immediate Reconstruction

International

Royal National Liverpool Hospital May 1994 M.Ch Orth. Guest Lecture, University of Liverpool
Topic: *" Management of Mangled Injuries of Limbs"*
Dr S Rajasekaran and Dr S Rajasubramaniyan

Kismet Institute Of Hand And Microsurgery, Louisville Kentucky, USA. June 1995
Topic: "One Stage *Reconstruction of Open Injuries of Limbs*"
Dr.S.Rajasekaran and Dr.S.Rajasubramaniyan

Nuffield Orthopaedic Center, Oxford UK. June 1997
Topic: *"Difficult Reconstruction Options in Mangled Extremities"*
Dr S Rajasekaran and Dr S Rajasubramaniyan

12th Congress Western Pacific Orthopaedic Association, Fukuoka Japan , November 1998
Topic: *"One Stage Staged Reconstruction of Soft Tissue and Bone Defects in Open Injuries of Limbs - A Year Prospective Study of 157 Fractures"*
Dr S Rajasekaran, Dr S Rajasubramaniyan and Dr J Dheenadhayalan

Asian Federation of Orthopaedics and Traumatology, Madrid, February 1999
Topic: *"Early or Staged Reconstruction of Open Injuries of Limbs"*
Dr S Rajasekaran and Dr S Rajasubramaniyan

SICOT, Syndey, Australia, April, 1999.
Topic: *"Early Total Reconstruction of Soft Tissue and Bony Defect in Mangled Extremities - A 5 Year Prospective Study"*
Dr S Rajasekaran and Dr S Rajasubramaniyan

Asia Pacific Orthopaedic Association - 12th Triennial Congress, April, Adelaide, Australia, 2000.
Topic: *"Day One Reconstruction of Soft Tissue & Bony Defects in Mangled Extremities- A 4 Year Prospective Study"*
Dr S Rajasekaran and Dr S Rajasubramaniyan

Orthopaedic Research Society, Annual Meeting, Dacca, February 2002
Topic: *"Management Of Open Injuries"*
Dr S Rajasekaran and Dr S Rajasubramaniyan

SICOT Meeting at San Diego, USA, August, 2002.
Topic: *"Immediate Total Reconstruction of Limbs in Open Injuries"*
Dr S Rajasekaran and Dr S Rajasubramaniyan

National

ORTHOCON'94, Coimbatore, November 1992
Topic: *"Limb Salvage in Grade III B & C Open Limb Injuries"*
Dr S Rajasekaran and Dr S Rajasubramaniyan

Tamil Nadu Orthopaedic Association, February 1993
Topic: *"Open Approach to Management of Limb Threatening Open Injuries"*
Dr S Rajasekaran and Dr S Rajasubramaniyan

Indian Orthopaedic Association, Annual Meeting, Guest Lecture,Manipal, 1995
Topic: *"Aggressive Reconstruction of Open Injuries to Limbs"*
Dr S Rajasekaran and Dr S Rajasubramaniyan

Tamil Nadu Orthopaedic Association, 1996 Chennai
Topic: *"Management of Open Limb Wounds Polytrauma with Neurovascular Problems"*
Dr S Rajasekaran and Dr S Rajasubramaniyan

Indo German Orthopaedic Association, Coimbatore, July 1997
Topic: *"What to do with Skeletal Injuries in Open Fractures?"*
Dr J. Dheenadhayalan and Dr S Rajasekaran

Indian Orthopaedic Association Conference - Kochi - November 1997
Topic: *"Primary Internal Fixation Compound Injuries"*
Dr S Rajasekaran

Tamil Nadu Orthopaedic Association of India, Coimbatore. Guest Lecture, February 2002
Topic: *" Avoiding Pitfalls in Management Of Open Injuries"*
Dr S Rajasekaran

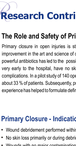
Instructional Course Lectures ICAOO, 2002 Guest Lecture, Madurai, April 2002
Topic:*" Decision Making in Open Fractures of Limbs"*
Dr S Rajasekaran

Indian Orthopaedic Association Annual Meeting, Patna, November, 2002
Topic: *"Decision Making in Open Injuries in Orthopaedics Workshop"*
Dr S Rajasekaran

Research Contributions - Trauma

Primary Bone Grafting in Open Injuries

Bone loss in open injuries is a difficult problem and is associated with a high incidence of non unions, infections and multiple secondary procedures to achieve bone union. Staged bone reconstruction is performed after a period of 12 weeks following soft tissue cover. This has the disadvantage of long treatment time, increased rate of non-union, higher number of secondary procedures and increased cost of treatment. The possibility of immediate soft tissue cover by possibility of immediate primary bone grafting thereby reducing the number of additional surgeries and treatment time. In a prospective study of 816 patients with open injuries, primary bone grafting was possible with a high degree of safety in 80 patients. The experience has led to the adoption of this innovative management protocol in more than 200 patients.


A Grade III B open fracture of the right leg treated by immediate thorough debridement, interlocked nailing, primary bone grafting and soft tissue cover with a rotational flap. The patient was ambulant with full weight bearing in 6 months with minimal shortening which reduced the cost, the hospital stay, number of secondary procedures required, and gave optimal functional outcome of the extremity.

Publications

Primary Bone Grafting in Open Injuries of Limbs with Bone Deficit- A Prospective Study in 80 Patients.
Journal of Tamil Nadu Orthopaedic Association, Volume 2# page no. 55-62, 2002
Dr. A.B.Rajendra Babu, Dr.S.Rajasekaran and Dr.S. Rajasubramaniyan

Presentations

Indo-German Orthopaedic Association, Hyderabad, July 1997
Topic: *"Can Reconstructive Procedures for Soft Tissue and Bony Defect be Safely Performed on Day One in Open Injuries?- A 4 Year Prospective Study of 157 Fractures"*
Dr S Rajasekaran and Dr.S. Rajasubramaniyan

Tamil Nadu Orthopaedic Association, 2002, Coimbatore
Topic:*"Primary Bone Grafting in Open Injuries of Limbs with Bone Deficit - A Prospective Study in 80 Patients"*
Dr. A.B.Rajendra Babu, Dr.S.Rajasekaran and Dr.S. Rajasubramaniyan


A Grade III B injury of the leg with no skin loss treated by debridement, internal fixation and primary skin closure, with good results.

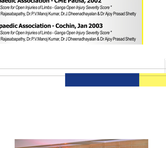
Research Contributions - Trauma

The Role and Safety of Primary Closure in Open Injuries

Primary closure in open injuries is still taboo due to the fear of infection. Early transfer to hospitals, improvement in the art and science of debridement, the immediate start of treatment and the availability of powerful antibiotics has led to the possibility of primary closure in a highly select group of patients who arrive very early to the hospital, have no skin loss either during injury or debridement and have no systemic complications. In a pilot study of 150 consecutive patients , primary closure was possible with a high level of safety in about 33 % of patients. Subsequently, primary closure has been performed in more than 300 patients and the experience has helped to formulate definite indications for the procedure.

Primary Closure - Indications

- Wound debridement performed within 8 hours of injury
- No skin loss primarily or during debridement
- Wounds with no major contamination
- No systemic or metabolic complications
- Skin approximation possible without tension


A Grade III B injury of the leg with no skin loss treated by debridement, internal fixation and primary skin closure, with good results.


Crush injury of the elbow with dislocation exposing the bone, managed by immediate debridement and primary closure with good functional outcome

Publications

Primary Closure in Open Fractures - A Prospective Study
Journal of Tamil Nadu Orthopaedic Association. Volume 2# Pg No: 55-62, 2002
Dr.R.Krishna Kumar, Dr.S. Rajasekaran & Dr. J. Dheenadhayalan

Presentations

Asia Pacific Orthopaedic Association 12th Triennial Congress, Adelaide, Australia, April 2000
Topic: *"Primary Closure of Open Injuries"*
Dr. S. Rajasekaran

TNOA Annual Conference, 2000 - Trichy
Topic: *"Primary Closure in Open Fractures - Advantageous or Adventurous? - A Prospective Study of 140 cases"*
Dr.R. Krishna Kumar, Dr.S. Rajasekaran & Dr. J. Dheenadhayalan

Research Contribution - Trauma

A Comprehensive Trauma Score To Prognosticate Outcome in Grade III B Open Injuries of Limbs

Although Gustilo's classification of open injuries is the most widely used classification, its use is restricted to a gross estimate of the need for soft tissue cover. It suffers from a high inter and intra observer variability and inability to encapsulate the important parameters of the rate of infection, the number of secondary procedures required, the time for bony union and the final functional result. The Ganga Hospital Trauma Score (GHTS) is a 15 point score where every year has facilitated the development of a new score for evaluating the severe injuries. Assessment of severity of the injury to all 3 components of the injured limb (covering tissues, functional tissues and the bone and joints) and inclusion of co-morbid factors form the highlights of the score. The score has been validated and found to predict with a great degree of accuracy the prognosis and functional outcome in major limb injuries.

No. Secondary Procedures



Bone Union Time



Patients were divided into 4 groups, Group I (Score < 5), Group II (Score 5 - 10), Group III (Score 11 - 15). Group IV (Score > 15). All patients in group IV underwent amputation. The results showed that there was a progressive and significant difference (p<0.05) between the other 3 groups in bone union time and need for soft tissue cover.

GANGA Hospital Open Injury Severity Score

Covering Structures: Skin and Fascia	Score
Wound not over the bone. No skin loss	1
Wound not over the bone with skin loss	2
Wound over the bone. No skin loss	3
Wound over the bone with Comminuted bone/Degloving over the bone	4
Circumferential wound with bone circumferentially exposed	5
Functional Tissues: Musculotendinous & Nerve units	
Injured muscle/tendon/nerve(MT) units	1
Repairable injury to MT units	2
Crushing with loss / Irreparable injury to MT units/Repairable nerve injuries	3
Loss of one component of MT units/ Irreparable nerve injuries	4
Loss of two or more components / Subtotal amputation	5
Structural Tissues: Bone and Joints	
Transverse / oblique fracture with persistent stripping	1
Butterfly fragment / comminut ed communition	2
Periarticular communition with joint incongruination	3
Bone loss < 4 cm/Segmental fracture < 4 cm/ Knee loss	4
Bone loss > 4 cm/Segmental fracture > 4 cm/ Knee loss	5
Co-morbid Conditions: Add 2 points for each condition present	

1. Open Injury > 12 Hrs.
2. Gross Wound Contamination / farmyard injuries
3. Age > 65 years
4. Debilitating diseases (DM, COPD, IHD etc.)
5. Fat embolism
6. Associated systemic injuries
7. Another major injury to the same limb

Presentations - International

Indian Orthopaedic Association - CME Patna, 2002
Topic: "Prognostication Score for Open Injuries of Limbs - Ganga Open Injury Severity Score."
Dr.S.Rajasekaran, Dr.S.Rajasubramaniyan, Dr.P.V.Manoj Kumar, Dr.J.Dheenadhayalan & Dr.Ajoy Prasad Shetty

Kerala Orthopaedic Association - Cochin, Jan 2003
Topic: Prognostication Score in Open Injuries of Limbs - Ganga Open Injury Severity Score."
Dr.S.Rajasekaran, Dr.S.Rajasubramaniyan, Dr.P.V.Manoj Kumar, Dr.J.Dheenadhayalan & Dr.Ajoy Prasad Shetty

Interlocking Nails

The technique of Interlocking Nails has become the gold standard in the treatment of long bone fractures of limbs. From 1992 this technique has been used extensively in Ganga Hospital for the treatment of all long bone fractures. The number of interlocking nails performed was 346 in the year 2000, 373 in the year 2001 and 414 in 2002. The high clinical load and the vast expertise has allowed many modifications in the techniques which have been widely presented.

Dr. Rajasekaran and Dr. Dheenadhayalan have also been on the faculty of many hands-on workshops and live surgical demonstrations for interlocking nails.

A double segmental fracture of the leg treated with interlocked Nailing with good results


A double segmental fracture of the thigh bone treated with Interlocked Nailing which is the gold standard in the treatment of long bone fractures.


Dr.S.Rajasekaran explaining the technique of the fourth generation SIRUS Interlocking Nail to the delegates at the Indian Orthopaedic Association Conference workshop.

Awards - International

PROF. M. Nalarajan GOLD MEDAL for the best paper, Tamil Nadu Orthopaedic Association Conference, Madurai, 1990
Topic:*"Interlocking Nails in Difficult Situations"*
Dr S Rajasekaran

Publications

Interlocked Nailing Controversies
Recent Trends in Fracture Management, 2001, Edited by Dr.D.K. Saraja
Dr. Ramakanth Rao and Dr.S.Rajasekaran.

Analysis of Changes in Compartment Pressure in Reamed Interlocking Nailing - A Clinical Study
Journal of Tamil Nadu Orthopaedic Association Volume 2# Pg. No 26-30, 2002
Dr.S.Rajasekaran, Dr.S. Naveen Kumar and Dr.C. Sekar

Salient Presentations on Interlocking Nails

National

Continuing Medical Education Programme of Madurai Medical College Madurai 2001
Topic:*" Controversies in Intramedullary Nailing"*
Dr J Dheenadhayalan

Howrah Orthopaedic Society Meeting, Howrah, Kolkata, October 2002
Topic: *"SIRUS Nail- Technique"*
Dr S Rajasekaran

Howrah Orthopaedic Society Meeting, Howrah, Kolkata, October 2002
Topic: *"Sirus- Technical Tips"*
Dr S Rajasekaran

Howrah Orthopaedic Society Meeting, Howrah, Kolkata, October 2002
Topic: *"Intramedullary Nailing of Tibia"*
Dr J Dheenadhayalan

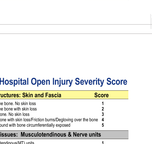
Tamil Nadu Orthopaedic Association Conference 2002 Coimbatore May 2002.
Topic: *"Avoiding Pitfalls in Interlocking Nailing"*
Dr J Dheenadhayalan

Indian Orthopaedic Association Annual Meeting, Patna, Nov 2002
Topic: *"Interlocking Nail for Compound Tibial Shaft Fractures"*
Dr S Rajasekaran

Indian Orthopaedic Association Annual Meeting, Patna, Trauma Society of India Sub-specialty Meeting, November 2002.
Topic: *"Use Of Intramedullary Nail In Proximal Femoral Fractures"*
Dr S Rajasekaran

Tamil Nadu Orthopaedic Association, Erode 1995.
Topic: *"Interlocking Nailing in Demanding Situations"*
Dr S Rajasekaran

Orthopaedic Research & Education Foundation, Patna, September 2001
Topic: *" Controversy and Pitfalls of Interlocking Nail"*
Dr S Rajasekaran


Dr.Dheenadhayalan giving a talk on Intramedullary Nailing of Tibia, Kolkata - October 2002

National

National Post Graduate Lecture Course at ICAOON 2001, Ahmedabad, December 2001
Topic: *" Intra-Medullary Nailing Femur"*
Dr S Rajasekaran

SIRUS Nail, ICAOON 2001, Ahmedabad, December 2001
Topic: *"Indian Experience Tibia"*
Dr S Rajasekaran

SIRUS Nail, ICAOON 2001, Ahmedabad, December 2001
Topic: *"Indian Experience Tibia"*
Dr S Rajasekaran

Symposium: Locking Nails in Proximal Femoral Fractures, ICAOON 2001, Ahmedabad, December 2001
Topic: *"SIRUS Nail for Proximal Femoral Fractures"*
Dr S Rajasekaran

International

Bangladesh Orthopaedic Society - Annual Meeting, Dacca, February 2002
Topic: *" Avoiding Pitfalls in Interlocking Nailing"*
Dr S Rajasekaran

Spine Surgery

One of the main thrusts of the orthopaedic department has been in the field of spine surgery. From 1991, the unit introduced and popularised many procedures in the region, such as Microdiscectomy, Micro Surgery for removal of spinal tumors, Complex Spinal fixations using anterior and posterior instrumentation, Spinal Deformity surgeries and Minimal Access Spinal deformities. State-of-the-art facilities and equipment including Carl Zeiss operating microscopes and various forms of spinal fixation systems are available. The unit now handles more than 5,000 new out patients, performs more than 350 major spinal surgeries per year and functions as a regional referral centre for spinal surgery for all spinal problems from the cranio-vertebral junction to the sacrum.

In 2001, the unit was recognized by the National Board of Examinations, New Delhi for Super-Specialty training in spinal surgery. The unit has trained over 10 DNB (Orthopaedics) and MCh (Neurosurgery) who have completed either MS or D.NB in Orthopaedic Surgery and MCh in Neurosurgery. In 2002 the Ganga-Johnson & Johnson Spine Fellowship was started. Following the visit of Dr. William D Dekutoski, Past President, Orthopaedic Research Society, USA to the unit in December 2000, this unit has been recognized by the North American Spine Society for short term fellowship for spine surgery. More than 25 fellows from all parts of India, Indonesia, Sri Lanka and China have undergone training so far.

Spine Team - Dr Ajoy Prasad Shetty, Dr. Ramchandran Rao, Dr.S.Rajasekaran & Dr.Rupert Pillays

Courses Conducted

Course Conducted	Year
International Course on Spine Surgery - 1	1994
International Course on Spine Surgery - 2	1998
International Course on Spine Surgery - 3	1999
International Course on Spine Surgery - 4	2000
International Course on Spine Surgery - 5	2002
International Course on Spinal Deformities	2003

Active pre-conference clinical discussion by the faculty of ICS-5

The spine unit has also remained in the forefront in conducting instructional courses, hands-on workshops and live surgery demonstration teaching sessions. These courses are some of the most popular courses in India and have been the best platforms for the field of spine surgery from around the world to share the wealth of knowledge and experience.

Surgeries Performed

Surgeries	1998	1999	2000	2001	2002
Surgeries for disc including Microdiscectomy / Chymopapain	81	83	81	101	142
Scoliosis & Kyphosis Correction	20	19	23	24	27
Spinal Infections	7	7	17	16	19
Spondylolisthesis	32	35	37	50	60
Tumour Surgery	10	16	14	17	20
Cervical Spine Surgeries	25	27	36	38	40
Spine Fractures	16	23	34	25	31
Miscellaneous	8	17	7	19	12
Total	**179**	**210**	**253**	**203**	**350**

Research Contribution-Spine

Deformity in Spinal Tuberculosis : its understanding and prevention

Many patients with spinal tuberculosis, especially children and with severe deformity. This is not only cosmetically disfiguring but also has the potential to cause severe neurological problems. Hence the prevention of deformity and the predisposing factors for spinal collapse were not known. A 10-year longitudinal study on children with spinal tuberculosis was undertaken by the unit.

Prof T.K Bhattacharyya & Dr S.Rajasekaran

These children formed a part of the MRC group of the Madras study of Tuberculosis of Spine. This study which has the longest follow up in the world for the difficult problem helped to identify three patterns of progress in deformity with growth. The importance of evaluation of deformity and radiological **"Spine at Risk"** parameters in the management of spinal tuberculosis was highlighted. A new method of measuring deformity was offered surgical cure. This study was awarded a PhD by the Tamil Nadu Dr.MGR Medical University, Chennai, and was conducted under the guidance of Dr.R.Prabhakar, former Director, Tuberculosis Centre, Chennai, under the expert supervision of Prof. T.K Bhanyopadhyaysen, Emeritus Professor, Madras Medical College, Chennai. This work received the following awards:

The sequelae of childhood spinal tuberculosis leading to severe deformity, pain and disability in the productive years. Prevention is the only solution and neurological deficit

Awards - International

SSLS- Salomon Gorad Award for **"Best Clinical Research Paper"** International Society for the Study of Lumbar Spine, Johannesburg, South Africa, May 2001
Dr.S.Rajasekaran

Dr.S.Rajasekaran - Travel Fellowship
Oxford Textbook of Orthopaedics & Trauma - Oxford University Press, UK, 2002. vol 2, pp 1345-1991
Dr.S.Rajasekaran and Prof.T.K Bhanmugasundaram

3. The Natural History of Childhood Spinal Tuberculosis
Clinical Orthopaedics and Related Research,2002, 398, pp.69-82
Dr.S.Rajasekaran

4. Chapter on **Spinal Tuberculosis**
Oxford Textbook of Orthopaedics & Trauma - Oxford University Press, UK, 2002. vol 2, pp 1345-1991
Dr.S.Rajasekaran and Prof.T.K Bhanmugasundaram

3. The Natural History of Childhood Spinal Tuberculosis
Clinical Orthopaedics and Related Research,2002, 398, pp.69-82
Dr.S.Rajasekaran

4. Chapter on **Tuberculosis of Spine**
The Lumbar Spine, 3rd edition, edited by Herkowitz HN, Dvorak J, Bell G, Nordin M and Grob D. to be published in 2003
Dr.S.Rajasekaran

5. Chapter on **Childhood Spinal Tuberculosis**
Inflammatory Disorders of Spine, edited by Govender Naba University Press South Africa, to be published in 2003
Dr.S.Rajasekaran

6. Anterior Release and Kyphodiosis of Gibbus Deformity in Tuberculosis of the Spine
J Bone and Joint Surg, 1997, 79A, 1510-1518
Dr.S.Rajasekaran and Dr.T.K Bhanmugasundaram

7. Natural History of Deformity in Childhood Tuberculosis of the Spine Treated by Anterior Arthrodesis
J Bone and Joint Surg, Oct 1999, 81A, 1314-1326
Dr.S.Rajasekaran and Dr.S.Soundararajanan

8. The Problem of Deformity in Spinal Tuberculosis
ICSS-5 Abstracts, 1993, Mumbai, France
Dr.S.Rajasekaran

9. Tuberculous Lesions of the Lumbosacral Region - A 15 Years Follow up of Patients Treated by Antituberculosis Chemotherapy
ICSS-5 Abstracts, 1997, Singapore
Dr.S.Rajasekaran

10. Tuberculous Lesions of the Lumbosacral Region -A 15 Year Follow up of Patients Treated by Antituberculosis Chemotherapy
Spine 1998; 23(10), 1163-1167
Dr.S.Rajasekaran and Dr.T.K Bhanmugasundaram

Awards - National

1.Dr. B. C. Roy Memorial Award for the year 2002, by the Medical Council of India in recognition for outstanding work
Topic: Spinal Tuberculosis
Dr.S.Rajasekaran

2.Tamil Nadu Government Scientist Award for the year 2000, presented by the Honorable Education Minister of Tamil Nadu, Mr.Tamil Durai, for outstanding research work in spinal tuberculosis
Topic: " *A Longitudinal Study on the Pattern of Deformity in Spinal Tuberculosis*"
Dr.S.Rajasekaran

3. Annual Award for the Best Treatise in Orthopaedics, Bombay Orthopaedic Society, 1998
Topic "Role and Fate of Bone Grafts in Modified Hong Kong Surgery"
Dr.S.Rajasekaran

4. Prof. Vyasswamy Gold Medal for the best paper, Tamil Nadu State Orthopaedic Annual Conference, Madurai, 1996
Topic: "Role and Fate of Bone Grafts in Modified Hong Kong Surgery"
Dr.S.Rajasekaran

A clubb with hyperpigmentation associated with the cervical thoracic junction demonstrating the Spine at risk' signs treated with tuberculosis, spinal fusion & instrumentation

Publications - International

1. The Problem of Deformity in Spinal Tuberculosis
Clinical Orthopaedics and Related Research, 2002, 398, pp.69-82
Dr.S.Rajasekaran

2. The Natural History of Childhood Spinal Tuberculosis
Oxford Textbook of Orthopaedics & Trauma - Oxford University Press, UK, 2002. vol 2, pp 1345-1991
Dr.S.Rajasekaran and Prof.T.K Bhanmugasundaram

3. The Natural History of Childhood Spinal Tuberculosis
Clinical Orthopaedics and Related Research,2002, 398, pp.69-82
Dr.S.Rajasekaran

4. Chapter on **Tuberculosis of Spine**
The Lumbar Spine, 3rd edition, edited by Herkowitz HN, Dvorak J, Bell G, Nordin M and Grob D. to be published in 2003
Dr.S.Rajasekaran

5. Chapter on **Childhood Spinal Tuberculosis**
Inflammatory Disorders of Spine, edited by Govender Naba University Press South Africa, to be published in 2003
Dr.S.Rajasekaran

6. Anterior Release and Kyphodiosis of Gibbus Deformity in Tuberculosis of the Spine
J Bone and Joint Surg, 1997, 79A, 1510-1518
Dr.S.Rajasekaran and Dr.T.K Bhanmugasundaram

7. Natural History of Deformity in Childhood Tuberculosis of the Spine Treated by Anterior Arthrodesis
J Bone and Joint Surg, Oct 1999, 81A, 1314-1326
Dr.S.Rajasekaran and Dr.S.Soundararajanan

8. The Problem of Deformity in Spinal Tuberculosis
ICSS-5 Abstracts, 1993, Mumbai, France
Dr.S.Rajasekaran

9. Tuberculous Lesions of the Lumbosacral Region - A 15 Years Follow up of Patients Treated by Antituberculosis Chemotherapy
ICSS-5 Abstracts, 1997, Singapore
Dr.S.Rajasekaran

10. Tuberculous Lesions of the Lumbosacral Region -A 15 Year Follow up of Patients Treated by Antituberculosis Chemotherapy
Spine 1998; 23(10), 1163-1167
Dr.S.Rajasekaran and Dr.T.K Bhanmugasundaram

Figure A - separation of the buccal fat pad
Figure B - Posterior extrusion

Spine at Risk' signs
Journal of Bone and Joint Surg (Br) 2001; 83 - B : 504 - 52

Figure C - Lateral translation
Figure D - Toppling tpe

A young man with Bilateral Kyphotic deformity corrected by single stage corrective osteotomy and pedicular instrumentation.

Salient Presentations on Spinal Tuberculosis

International

1. **International Society for Study of Lumbar Spine**, Singapore, June 1997
Topic **"Tuberculous Lesions of the Lumbosacral Region - Long Term Follow up of 15 Years"**
Dr.S.Rajasekaran and Dr.T.K Bhanmugasundaram, USA, March 1998

Topic **"Tuberculous Lesions of the Lumbosacral Region-Long Term Follow up of 15 Years"**

3. **World Spine**, Berlin, Germany, August / September 2000

Topic **"The Natural History of Childhood Tuberculosis of the Spine - A 10 Year Prospective Study"**

4. **International Society for the Study of Lumbar Spine**, Australia, April, 2000
Topic **"Growth Related Changes in Kyphotic Deformity in Invasive Childhood Spinal Tuberculosis"**

5. **World Spine**, Berlin, Germany, August / September 2000

Topic **"Natural History of Post Tuberculous Kyphosis in Children and Its Operative Spinal Tuberculosis"**

6. **Asia Pacific Orthopaedic Association 12th Triennial Congress**, Adelaide, Australia, April, 2000
Topic **"Spinal Growth Retardation Due to Paralysis Due to Collapse in Childhood Spinal Tuberculosis"**

7. **Operative Spine Course - New Orthopaedic Association**, Kuala Lumpur Malaysia, September 2001 Faculty member

Topic **"Natural History of Post Tubercular Kyphosis in Children and the Patterns of Progress during the Period of Growth"**

8. **Bangladesh Orthopaedic Society, Annual Meeting**, Dhaka, February, 2001
Topic **"Childhood Spinal Tuberculosis"**

9. **Annual meeting of The International Society for the Lumbar Study**, Cleveland, USA, May, 2002
Topic **"Tuberculous Lesions of the Lumbosacral Region - Long Term Follow up of 15 Years"**

10.**20th Combined Meeting of the Singapore Orthopaedic Association Meeting**, Singapore, October, 2002
Topic **"Natural History of Childhood Spinal Tuberculosis"**

11. **20th Combined Meeting of the Singapore Orthopaedic Association Meeting**, Singapore, October 2002
Topic **"Bursting Collapse of the Spine in Childhood Spinal Tuberculosis and its Implications in Late Onset Paraplegia"**

National

1. **International Bone and Joint Tuberculosis Club Conference**, Chennai1983
Topic **"Prognosis of Gibbus Deformity in Tuberculosis of the Spine"**
2. **Tamil Nadu Orthopaedic Association State Conference**, Ooty, 1984
Topic **"Role and Fate of Bone Grafts in Modified Hong Kong Surgery"**
3. **Tamil Nadu Orthopaedic State Conference**, Madurai, 1985
Topic **"Role and Fate of Bone Grafts in Modified Hong Kong Surgery"**
4. **Indian Orthopaedic Association Annual Conference**, Madras, 1985
Topic **"The Role and Fate of Bone Grafts in Anterior Spinal Fusion in Tuberculosis of the Spine"**
5. **Golden Jubilee Conference of Bombay Orthopaedic Society**, December 1989
Topic **"Progression of Kyphosis in Tuberculosis of the Spine Treated by Modified Hong Kong Surgery"**
6. **Indian Orthopaedic Annual Conference**, Chennai 1992
Topic **"Problem of Deformity in Spinal Tuberculosis"**
7. **Tamil Nadu Orthopaedic Association Conference**, Kanyakumari, April 1997
Topic **"Spinal Tuberculosis"**
8. **Karnataka Orthopaedic Association**, Guest Lecture, Bangalore February 1998
Topic **"Natural History of Post Tubercular Kyphosis in Children"**
9. **Indian Orthopaedic Association - 44th Annual Conference Hyderabad**, session co-chairman, December 1999
Topic **"Tuberculosis of Lumbar Spine"**
10. **Paediatric Orthopaedic Society of India, Annual Meeting**, Guest Lecture, Mumbai, March 2000
Topic **"Skeletal Tuberculosis in Children"**
11. **Paediatric Orthopaedic Society of India, Annual Meeting**, Guest Lecture, Mumbai, March 2000
Topic **"TB Spine in Children - Changing Concepts in Management"**
12. **Paediatric Orthopaedic Society of India,** GuestLecture, Mumbai, March 2000
Topic **"Natural History of Post Tubercular Kyphosis in Children"**
13. **Instructional Course Lecture American Academy of Orthopaedic Surgery and Indian Orthopaedic Association**, Jaipur October 2000.
Topic **"Current Concepts in the Management of Spinal Tuberculosis"**
14. **Annual Conference of Association of Spine Surgeons of India**, New Delhi February 2001 Faculty member
Topic **"Biomechanical Analysis of Bursting Collapse in Childhood Spinal Tuberculosis"**
15. **Paediatric Orthopaedic Society of India**, Madurai, March 2001 Plenary Session Faculty member
Topic **"Tuberculosis of Spine in Children"**
16. **Spine Speciality Convention of all ICACON 2001** in Ahmedabad
Topic **"Instrumentation in Tuberculosis of Spine"**

Research Contribution - Spine

FEM Analysis of Paediatric Spine

The FEM study was done with the help of the Department of Mechanical and Production Engineering, PSG College of Technology. A computer model of the spine was designed using the software ANSYS. Using the radiographs of patients with spinal tuberculosis sinister defects were created in the model to simulate the conditions of spine in the patients. The model was then loaded in the same way as in the patient and generated in the spinal column were analysed. This study gave insights to the biomechanical basis of the phenomenon of **"buckling collapse of the spine"** which is unique to spinal tuberculosis.

TESP computerised model of the paediatric spine, to study the mechanical forces across the unstable spine and the pattern of deformity. Work done in collaboration with Prof. Bishan Mani, Mrs. P.R. Thyla & Mr. V.Radha Raju, Department of Mechanical and Production Engineering, PSG College of Technology

Awards - International

SSLS- Salomon Gorad Award for **"Best Clinical Research Paper"** at the annual meeting of the International Society for the Study of Lumbar Spine, at Cleveland, USA, May, 2002.
Topic: **"Biomechanical Analysis of Bursting Collapse in Childhood Spinal Tuberculosis"**
Dr.S.Rajasekaran

The FEM study done that during collapse, the tensile forces occurring at the posterior column caused the posterior elements to cause forward dislocation. This meant signifies as a "buckle of a tension" and leads to bursting collapse.

Research Contribution - Spine

Awards - International

1.**Prof. A. Subramanian Gold Medal** for Best Basic Science Research Award, Tamil Nadu Orthopaedic Association Annual Conference, Kodaikanal, Feb 2001
Topic: **"Role of Bone Morphogenetic Protein in Human Lumbar Intervertebral Discs - an MRI evaluation in normal volunteers and low back pain patients"**
Dr.Rajasekaran, Dr.R.Arun and Dr.Murugan

2.**Best Poster Presentation** at the ASICON,CSI 2003 Association of Spine Surgeons of India, IKA Annual Conference), Varanasi
Topic: **"Role of Bone Morphogenetic Protein in Human Lumbar Intervertebral Discs - an MRI evaluation in normal volunteers and low back pain patients"**
Dr.S.Rajasekaran, Dr.R.Arun and Dr.Murugan

Awards - National

1.Dr. B. C. Roy Memorial Award for the year 2002, by the Medical Council of India in recognition for outstanding work
Topic: Spinal Tuberculosis
Dr.S.Rajasekaran

2.Tamil Nadu Government Scientist Award for the year 2000, presented by the Honorable Education Minister of Tamil Nadu, Mr.Tamil Durai, for outstanding research work in spinal tuberculosis
Topic: " *A Longitudinal Study on the Pattern of Deformity in Spinal Tuberculosis*"
Dr.S.Rajasekaran

3. Annual Award for the Best Treatise in Orthopaedics, Bombay Orthopaedic Society, 1998
Topic "Role and Fate of Bone Grafts in Modified Hong Kong Surgery"
Dr.S.Rajasekaran

4. Prof. Vyasswamy Gold Medal for the best paper, Tamil Nadu State Orthopaedic Annual Conference, Madurai, 1996
Topic: "Role and Fate of Bone Grafts in Modified Hong Kong Surgery"
Dr.S.Rajasekaran

Spinal Deformities

Scoliosis

Spinal deformity is perhaps the most devastating physical deformity. The plight of the crooked spinest and the 'hunch backs' are well described in our mythology from olden times. Spinal deformities not only causes cosmetic deformity resulting in poor self-esteem, but can also result in cardio respiratory problems and paralysis of limbs in very severe cases. The fear of surgical complications and ignorance that a safe surgical solution is possible, have very often resulted in the patient not seeking help. Recent advancements in modern spinal surgery have made surgical correction of this complex problem very safe.

Surgery for both scoliosis (side bending deformities) and kyphosis (hunch back deformities) are routinely performed with a great degree of success. Surgical correction for scoliosis is performed by modern techniques which avoid distraction thereby increasing the safety of the procedure. Pedicle Screws fixations are used for the entire length of the spine thereby allowing greater correction and reducing chances of implant loosening or pseudarthrosis.

Before Surgery
Scoliosis correction done by posterior pedicular instrumentation and fusion

After Surgery

Before Surgery
Scoliosis correction done by anterior instrumentation and fusion

After Surgery

Kyphosis

The commonest cause of hunch back deformity in India is spinal tuberculosis. Extensive destruction of the vertebral bodies and instability result in progressive deformity. Surgical stabilisation and fusion done at the right time will help to prevent spinal collapse. Even in patients who have established hunch back deformity excellent correction is obtained by single stage osteotomy and spinal shortening and fixation procedures. The unit is at present concentrating on the technique of single stage spinal shortening to correct massive kyphotic deformities.

A 3 year old girl showing a Kyphotic deformity and the presence of 'Spina at risk' signs indicating the association of instability. The girl was managed by a posterior column resection, shortening, global fusion and posterior pedicular instrumentation.

Primary Vertebral Tumors

Primary benign and malignant tumors of the spine offer major challenges in treatment because of the difficulties in surgical approach, difficulties in technique of radical excision and their resistance to radiation and chemotherapy. The unit has vast experience in total excision of primary vertebral tumors and reconstruction. The availability of preoperative embolization which reduces intra operative bleeding and modern spinal implants including titanium cages allows complete excision of tumor and functional reconstruction.

Haemangioma of the lumbar vertebra in a young man treated by global resection, fusion and instrumentation

Aneurysmal bone cyst of the cervical spine with global involvement treated by global resection & instrumentation

Awards

Prof. Vyasswamy Gold Medal for the best paper, Tamil Nadu State Orthopaedic Annual Conference, Chennai, 1996
Topic: **"Surgical Strategy for Primary Vertebral Tumours"**
Dr.Sunil Nimal and Dr.S.Rajasekaran

Publications

Tumours of the Spine in Scientific Publication
XXI Continuing Orthopaedic Education Course at Goa, September, 2002
Dr.S.Rajasekaran

Presentations - International

Asia Pacific Orthopaedic Association 12th Triennial Congress, Adelaide, Australia, April, 2000
Topic: **"Primary Vertebral Tumours: Surgical Strategy"**
Bangladesh Orthopaedic Society, Annual Meeting, Dhaka, Feb 2000
Topic: **"Management of Primary Vertebral Tumours"**
20th Combined Meeting of the Singapore Orthopaedic Association Meeting, Singapore, October, 2002
Topic: **"Surgical Strategy in Primary Vertebral Tumours"**

Presentations - National

Tamil Nadu Orthopaedic Association, Kanyakumari, February, Thanjavur, February 1997
Topic: **"Surgical Strategy for Primary Vertebral Tumours"**
Topic: **"Stand Out Tumours of the Spine"**
Tamil Nadu Orthopaedic Association, Thanjavur 1997
Topic: **"Stand Out Tumours of the Spine"**
Indian Orthopaedic Association Conference, Jabalpur, December 1998
Topic: **"Surgical Strategy for Complex Excision of Vertebral Tumours"**
Tamil Nadu Orthopaedic Association, Ooty, September, 2002
Topic: **"Tumours of the Spine in Geriatric Population"**
Indian Orthopaedic Association, Annual Meeting, Patna, AIIO Sub-specialty Course, 2002
Topic: **"Management of Cervical Vertebral Tumors"**

Microdiscectomy for Lumbar and Cervical Disc Disease

Disc disease is the most common surgical procedure done and microdiscectomy has been routinely performed since 1991. While the use of microscope improves the safety and achieves better results for cervical discs, it has the advantage of a small incision, less blood loss, less pain, early mobilization and early return to work in the lumbar disc surgery. In 2002, a total of 142 lumbar discectomies and 25 cervical disc surgeries were performed. The unit has conducted workshops on this important surgical procedure and presented many papers.

Microdiscectomy in progress

Before Surgery
Lumbar disc herniation

After Surgery
Microdiscectomy of L5 nerve L1 sectioned by posterior pedicular instrumentation

Before Surgery

After Surgery

A 40- threatening cervical CA cover CSI. Nuclear Medicine Bone Scan showing Multiple Metastatic Deposits in Vertebrae and Ilium. Thereby reducing the prevalence of the spinal cord

Presentations

International Course on Spine Surgery, Coimbatore, 1994/
Topic: "Video Demonstration Techniques of Microdiscectomy"

Instructional Course on Spine Surgery, 1994/
Topic: "Techniques of Microdiscectomy"

Tamil Nadu Orthopaedics Association, Coimbatore, February 2002
Topic: "Management Options for Degenerative Disc Disease"

Asia Pacific Orthopaedic Association, Coimbatore, April 2002
Topic: "Degenerative Disc Diseases: Which Spine"

Instructional Course on Spine, Ganga Hospital, Coimbatore, April 2002
Topic: "Management Options for Degenerative Disc Disease"

Instructional Course on Spine, Ganga Hospital, Coimbatore, April 2002
Topic: "Live Surgical Demonstration of Lumar Options for Degenerative Disc Disease"

Spinal Trauma

The incidence of spine trauma in this part of the country is high due to a large number of people involved in agricultural work of manual harvesting of coconut and arecanut trees. Patients are appropriately treated either conservatively or surgically depending on the clinical presentation and neurological status. About 30 surgeries are performed annually to stabilise the traumatised spines. In patients without canal compromise and not regrogressive, the technique of biological per cutaneous internal fixation is performed. Patients with fractures of the spine with neck injuries with spine fractures are treated by anterior or posterior or combined stabilisation as per the fracture.

Research Contribution - Spine

Solute Transport across Lumbar Disc

The disc being the largest avascular structure is only dispersal entirely on diffusion for its nutrition and function. Methods to evaluate and quantify the changes in diffusion can throw light on the potential causes of the disc and also provide a reliable method to evaluate the influence of various factors on the degeneration of disc such as heavy mechanical loading, exercise, smoking and various pharmacological agents. Although the importance of diffusion in the nutrition of intervertebral disc is well known, there is no direct evidence in the human longitudinal studies. Dr Rajasekaran and Dr.Murugan (Director, Ganday MRI Centre, Coimbatore) have been involved in finding the normal diffusion pattern in human lumbar discs and also its variation with various pathological conditions in the lumbar spine. This work has been performed on 32 human volunteers and patients and is the largest series in world literature.

Dr Rajasekaran and Dr Murugan, Director, Ganday MRI Centre

Publication

A Study of Diffusion Pattern in Human Lumbar Intervertebral Discs - an MRI evaluation in normal volunteers and low back pain patients
Spine Knees Orthopaedic Association Journal, 2002
Dr.S.Rajasekaran, Dr.R.Arun and Dr.Murugan

Figure shows the 3d box pattern of diffusion across the human normal lumbar intervertebral discs which was established for the first time in literature

Comparison of CSA measure were done on 32 normal volunteers and patients with disc degeneration. The results of the study showed that the CSA was significantly decreased in the low back pain patients and the rate of diffusion from peripheral to central.

Awards

1. **Prof. A. Subramanian Gold Medal** for Best Basic Science Research Award, Tamil Nadu Orthopaedic Association Annual Conference, Kodaikanal, Feb 2001
Topic: **"Role of Bone Morphogenetic Protein in Human Lumbar Intervertebral Discs - an MRI evaluation in normal volunteers and low back pain patients"**
Dr.Rajasekaran, Dr.R.Arun and Dr.Murugan

2. **Best Poster Presentation** at the ASICON,CSI 2003 Association of Spine Surgeons of India, IKA Annual Conference), Varanasi
Topic: **"Role of Bone Morphogenetic Protein in Human Lumbar Intervertebral Discs - an MRI evaluation in normal volunteers and low back pain patients"**
Dr.S.Rajasekaran, Dr.R.Arun and Dr.Murugan

Presentation

Tamil Nadu Orthopaedic Association, Annual Conference, 2003
"A Study of Diffusion Pattern in Human Lumbar Intervertebral Discs - an MRI evaluation in normal volunteers and low back pain patients"

Paediatric Orthopaedics

The unit performed 247 surgeries in 2000 and 252 surgeries in 2001 for children with orthopaedic problems. Most of these problems involved birth deformities or deformities due to nutritional deficiencies, neurological problems like cerebral palsy or post polio paralysis. Unfortunately many of these children belong to the lower socioeconomic group and their treatment is neglected for want of financial resources. Recognizing this problem, Ganga Hospital performs most such surgeries at subsidized costs, under a 'No profit' basis. The hospital's '**Project Helpline**' in conjunction with **Coimbatore City Round Table 31** has gone a long way to financially support the children whose families cannot afford even the basic cost of the surgeries.

Club Foot Correction Surgery



Bilateral club foot in a 4 month old child corrected surgically with good results

Polio Correction Surgery



Before Surgery | After Surgery

A patient who was walking on all four limbs was operated on the hip and spine and made ambulant

Presentations

Paediatric Orthopaedic Society of India, Pune, 1998
Topic " *Treatment of Fracture Shaft of Femur in Pediatric Age Group by External Fixation*"
Dr Shasidhar Reddy, Dr S Rajasekaran and Dr J Dheenadhayalan

Paediatric Orthopaedic Society of India, Pune, 1998
Topic " *Supracondylar Osteotomy in flexion Contracture of Knee in Poliomyelitis*"
Dr J Dheenadhayalan and Dr S Rajasekaran

TNOA, Coimbatore. 2002
Topic "*Free Fibular Transfer vs Ilizarov for Pseudarthrosis Tibia*"
Dr Krishnakumar, Dr S Rajasabapathy and Dr S Rajasekaran

World Orthopaedic Concern International San Diego, USA 2002
Topic "*Free Fibular Transfer in Pseudoarthosis Tibia*"
Dr J Dheenadhayalan, Dr S Rajasabapathy & Dr S Rajasekaran

Surgeries	1998	1999	2000	2001	2002
CTEV	37	31	41	62	58
Limb Deformity	54	62	68	41	44
Cerebral Palsy	37	33	48	51	56
Infection	42	39	42	47	58
Polio	28	33	48	51	53

Publication

Prospective Study of Outcome of Suturing vs. Non Suturing of Tendons in CTEV
Journal of the Tamil Nadu Orthopaedic Association - 2003
Dr.S.Rajasekaran, Dr.A.P.Shetty and Dr.Durga Nagaraju

Arthroscopy

Arthroscopy of the knee for diagnostic and therapeutic purposes is performed routinely. Excision or repair of the meniscus and arthroscopic ACL reconstruction are performed in association with **Dr.D.V.Rajan**, specialist in Arthroscopy and Sports Medicine. These procedures have helped to radically change the functional results in problems of the knee. **44** patients underwent these procedures in 2000, 27 patients in 2001 and 29 patients in 2002.



Keyhole Surgery

Awards

Silver Jubilee Award for Original Research, 2002 from Medical Council of India carrying a special Medallion and cash award of Rs.1 lakh - awarded by the President of India.
Topic : "*Childhood Spinal Tuberculosis*" - Dr S Rajasekaran

SICOT Paper Award for presentation at the SICOT Meeting, San Diego, USA. Aug 2002
Topic: " *Immediate Total Reconstruction of Limbs in Open Injuries*" - Dr S Rajasekaran

ISSLS- Sofamer Danek Award for "**Best Clinical Research Paper**" International Society for the Study of Lumbar Spine, Annual meeting at Cleveland, USA. May 14-18, 2002
Topic: "*Biomechanical Analysis of Buckling Collapse in Childhood Spinal Tuberculosis*" - Dr S Rajasekaran

Vocational Excellence Award of Rotary Club of Coimbatore West, on 23rd October 2000.
Dr S Rajasekaran

Prof.A.Subramaniam Gold Medal for "**Best Basic Science Research Award**" Tamil Nadu Orthopaedic Association- Annual Conference, Chennai- Feb 2001
Topic: "*Biomechanical Analysis of Buckling Collapse in Childhood Spinal Tuberculosis by the Creation of a Finite Element Model (FEM) of a Paediatric Spine.*" - Dr S Rajasekaran

Tamil Nadu Government Scientist Award" for the year 2000.Presented By **Honorable Education Minister of Tamil Nadu**,Mr.Tambi Durai for outstanding research work on "**Spinal Tuberculosis**".
Topic: " *A Longitudinal Study on the Pattern of Deformity in Spinal Tuberculosis*" - Dr S Rajasekaran

ORMED Indo-German Orthopaedic Foundation Award Best Orthopaedic Research presentation, Hyderabad, 1997
Topic: " *How far can we go on Day One Reconstruction in Open Injuries ?*" - Dr S Rajasekaran

ISSLS- Sofamer Danek Award" for "**Best Clinical Research Paper**" International Society for the Study of Lumbar Spine, Annual meeting, Singapore, 1996
Topic: "*Tuberculous Lesions of the Lumbosacral Region - A 15 Year Follow-up of Patients treated by Ambulant Chemotherapy*"
Dr S Rajasekaran

A K Talwalker Oration" Maharashtra Orthopaedic Association, Aurangabad,, 1999
Topic: "*Spinal Instability : Its Understanding and Clinical Applications*" - Dr S Rajasekaran

International Fellowship Award of International Society for Study of Lumbar Spine - Marseilles, France, May 1993
Topic "*The Problem of Deformity in Spinal Tuberculosis*" - Dr S Rajasekaran

A A Mehta Gold Medal for the **Best Paper Presentation**, Indian Orthopaedic Association Conference, Kochi, November 1997
Topic: "*Primary Internal Fixation in Open Injuries*" - Dr S Rajasekaran



Honourable Minister for Education, Government of Tamil Nadu, presenting the prestigious Tamil Nadu Scientist Award to Dr. S.Rajasekaran for his work on Spinal Tuberculosis.



Dr.Dhanasekara Raja receiving the Best Poster Presentation Award for Resection arthrodesis of knee with long intramedullary nail at TNOA 2003, Kodaikanal



Dr.S.Rajasekaran receiving the Vocational Excellence Award of Rotary International District 3200 from the President of the Rotary Club of Coimbatore West

Current Research Work

1. Prospective Study of Outcome of Suturing vs. Non-suturing of Tendons in CTEV
Dr. Durga Nagaraju, Dr. S.Rajasekaran and Dr. Ajoy Prasad Shetty

2.Late Infection in Open Injuries
Dr. G.Poornanand, Dr. S.Rajasekaran and Dr. Dheenadhayalan

3.Comparison of Biological and DCS Fixation with or without Bone Grafting in Supra Condylar Femur Fractures
Dr. Diwakar Raju.K, Dr. S.Rajasekaran and Dr. Dheenadhayalan

4.Analysis of Outcome in Acetabular Fractures
Dr. Uday Kiran, Dr. S.Rajasekaran and Dr. Ajoy Prasad Shetty

5.Limb Reconstruction System in Open Injuries with Bone Loss
Dr. Sasikumar, Dr. S.Rajasekaran and Dr. Dheenadhayalan

6 An Analysis of Outcome of Total Knee Replacements in Grossly Deformed Knees
Dr. Dhanasekar Raja, Dr. S.Rajasekaran and Dr. Dheenadayalan

7.Outcome of Internal Decompression in Lumbar Canal Stenosis
Dr. Mubarak Ali, Dr. S.Rajasekaran and Dr. Ajoy Prasad Shetty

8.Hybrid Fixation for Tibial Plateau Fractures
Dr. Chandrashekara.C.M., Dr. S.Rajasekaran and Dr. Dheenadhayalan

9.The Use of Regular Audit in Reducing the Rate of Complications in a Busy Orthopaedic Unit
Dr. Ramalingam.K, S.Rajasekaran and Dr. Ajoy Prasad Shetty

10. A Study of Solute Transport in Human Lumbar Intervertebral Discs
.Dr. B. Roy Wilson Armstrong, Dr. S.Rajasekaran and Dr. Murugan

11.A Simple Method of Extraction of Broken Femoral Prosthesis
Dr. B.C.Bhanu Prrakash, Dr. S.Rajasekaran and Dr. Dheenadhayalan

12.Biological Fixation of Thoracolumbar Fractures
Dr .I.Ramakanth Rao, Dr. S.Rajasekaran and Dr. Ajoy Prasad Shetty

13.A Clinical Radiological & Operative Correlation of Consecutive 100 Lumbar Intervertebral Disc Prolapses
Dr. Yogesh.K.Pithwa, Dr. S.Rajasekaran and Dr. Ajoy Prasad Shetty

14.Concomitant Bone Transport after Immediate Flap Cover in Open Injuries with Bone Deficit
Dr. J.Naresh babu, Dr. S.Rajasekaran and Dr. Dheenadhayalan

15.Role of Spinal Shortening in Correction of Kyphosis in Spinal Tuberculosis
Dr. S.Rajasekaran



Research in progress



Library



Library

Adequate facilities and funding are available for both clinical and basic research work. The Ganga Trust for Orthopaedic Education & Research funds both.

Academic Activities

The academic work of the department is guided by Academic Director **Prof. Dr. M.V. Daniel**, former Head of the Department of Orthopaedic Surgery, Christian Medical College, Vellore, and is supervised by the Head of the Department, **Dr. S. Rajasekaran**. Prof. M.V. Daniel's clinical and academic experience in heading the illustrious orthopaedic unit of Christian Medical College, Vellore, for many decades and his passion for proper records and protocol have helped to transform this clinical unit into a good academic unit. The unit lays great emphasis on proper documentation and regular clinical audits. This meticulous record keeping has helped in prospective and retrospective clinical research.

Ganga Hospital conducts regular courses and is a popular centre of teaching with well sought after fellowships and courses in orthopaedic and para-orthopaedic fields.



Prof. Dr. M.V.Daniel
MS (Gen), MS (Ortho), FACS (Ortho)

Diplomate of National Board (D.NB) Post Graduate Course in Orthopaedic Surgery

|The unit is recognized for post graduate training in Orthopaedic Surgery by the National Board of Examinations (NBE) since 1997 and currently trains four candidates every year. Candidates are selected strictly on merit, by MCQ examination and interviews. Regular teaching programs include clinical demonstrations, Journal Club, Seminars, Symposiums and Sessions on Radiology and Orthropathology making this unit one of the best training centres in the country. Periodic guest lectures are also arranged, where eminent persons from India and abroad are invited to lecture on their fields of interest and also conduct clinical sessions.

The following candidates have completed or are undergoing the course:

1. **Dr. Dinesh Kumar Shetty** : 1997 Thesis : Patterns of muscle paralysis in poliomyelitis
2. **Dr. Sasidhar Reddy** : 1998 Thesis : Longitudinal analysis of deformity in childhood spinal tuberculosis
3. **Dr. Badrinath . T.P** : 1999 Thesis : Determinants in functional outcome of open injuries of limbs
4. **Dr. M M Farooq** : 2000 Thesis : Post-operative implant failures and non-unions - Where lies the fault?
5. **Dr R Krishna Kumar** : 2000 Thesis : Primary closure in open injuries : A prospective study
6. **Dr A B Rajendra Babu** : 2000 Thesis : Primary bone grafting in open injuries of limbs with bone deficits -: A Prospective study in 60 patients
7. **Dr R Arun** : 2000 Thesis : Study of outcome of non-instrumented fusion in cervical discectomies
8. **Durga Nagaraju** : 2001 Thesis : Prospective study of outcome of suturing vs. non suturing of tendons in CTEV
9. **Dr. G.Poornanand** : 2001 Thesis : Late infection in compound injuries.
10. **Dr. Naveen Kumar** : 2001 Thesis : Analysis of intra-compartmental pressure changes in closed interlocking nailing of tibial fractures
11. **Dr. Janarthana Aithala.P** : 2001 Thesis : Management of proximal and distal fractures of the leg by interlocking nailing
12. **Dr. Divakar Raju.K.** : 2002 Thesis : Comparison of biological and DCS fixation with or without bone grafting in supra condylar femur fractures
13. **Dr. Udai Kiran** : 2002 Analysis of outcome in acetabular fractures
14. **Dr. Sasikumar** : 2002 Thesis : Limb reconstruction system in open injuries with bone loss
15. **Dr. Dhanasekar Raja. D** : 2002 Thesis: An analysis of outcome of Total Knee Replacements in grossly deformed knees
16. **Dr. Mubarak Ali** : 2003 Thesis : Outcome of internal decompression in lumbar canal stenosis
17. **Dr. Chandrashekara.C.M.** : 2003 Thesis : Hybrid fixation for tibial plateau fractures
18. **Dr. Ramalingam.K** : 2003 Thesis : The use of regular audit in reducing the rate of complications in a busy orthopaedic unit
19. **Dr. B. Roy Wilson Armstrong** : 2003 Thesis : A study of solute transport in human lumbar intervertebral discs



Prof.Devadoss inaugurating the D.N.B course





Dr. Dinesh Kumar Shetty & Dr. Sasidhar Reddy
1st batch of D.N.B candidates

Contributions to Text Books and Important Publications

Chapter on **"Spinal Tuberculosis"**
Oxford Textbook of Orthopaedics & Trauma - Oxford University Press, UK, 2002, vol 2
Dr S Rajasekaran and Prof. T K Shanmugasundaram

Chapter on **"Bone & Joint Infections"**
Oxford Textbook of Orthopaedics & Trauma - Oxford University Press, UK, 2002, vol 2
Dr S Rajasekaran and Dr J Dheenadhayalan

Chapter on **"Polio Myelitis"**
Oxford Textbook of Orthopaedics & Trauma - Oxford University Press, UK, 2002, vol 2
Prof Benjamin Joseph and Dr S Rajasekaran

Chapter on **"Miscellaneous Orthopaedic Infections"**
Oxford Textbook of Orthopaedics & Trauma - Oxford University Press, UK, 2002, vol 2
Dr S Rajasekaran and Dr Ajoy P Shetty

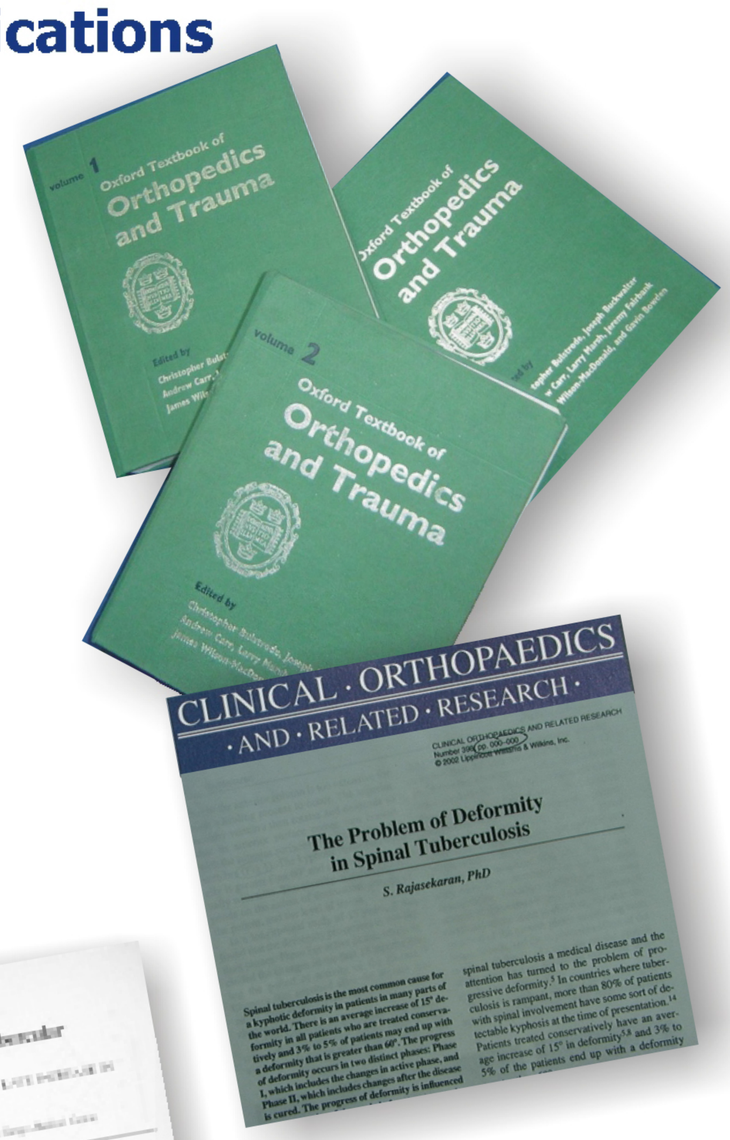
Chapter on **"Tuberculosis of Spine"**
The Lumbar Spine, 3rd edition, edited by Herkowitz HN, Dvorak J, Bell G, Nordin M and Grob D, to be published in 2003
Dr S Rajasekaran

Chapter on **"Childhood Spinal Tuberculosis"**
Inflammatory Disorders of Spine", Natal University Press South Africa, to be published in 2003
Dr S Rajasekaran

"**Morphological Changes seen in Childhood Spinal Tuberculosis - A 15 year Prospective Study of Children Treated by Ambulant Chemotherapy**"
Journal of Bone & Joint Surgery (Am), accepted for publication in 2003
Dr S Rajasekaran et al

"**Spontaneous Tendon Ruptures in Alkaptonuria**"
Journal of Bone & Joint Surgery (Br), to be published in June 2003
Dr. Manoj Kumar and Dr S Rajasekaran

"**Baastrup's disease**" as a cause of neurogenic claudication. A case report.
Spine July 1st 2003
Dr. Yogesh K Pithwa & Dr S Rajasekaran



Other Salient Publications and Presentations



Presentations

Tamil Nadu Orthopaedic Association, Vellore, 1994
Topic: *Aggressive Management of Resistant Post Operative Orthopaedic Infections*
Dr J Dheenadhayalan

Tamil Nadu Orthopaedic Association, Chennai, 1996
Topic: *Shoulder Stabilization with Inferior Capsular Shift for Recurrent Dislocation*
Dr J Dheenadhayalan

Tamil Nadu Orthopaedic Association, Chennai, 1996
Topic: *"Hybrid Fixation of Tibial Plateau Factures"*
Dr S Rajasekaran

SICOT, Syndey, Australia, April, 1999
Topic *: "Hybrid Fixation of Complex Tibial Plateau Fractures"*
Dr S Rajasekaran

Emerging trends in Shoulder Surgery Sooriya Hospital, Chennai, 2000
Topic: *Shoulder Instability- Role of Open Surgery*
Dr J. Dheenadhayalan

IMA Chapter, Anamalai 2000
Topic: *Trends in Management of Fractures*
Dr J Dheenadhayalan

Orthopaedic Research & Education Foundation, Patna, September 2001
Topic: *"Proximal Tibial Fractures"*
Dr S Rajasekaran

Orthopaedic Research & Education Foundation, Patna, September 2001
Topic: *"Percutaneous Reduction and Hybrid Fixation of Complete Tibial Plateau Fracture - A 4 Year Follow Up in 120 Patients"*
Dr S Rajasekaran

Orthopaedic Research & Education Foundation, Patna, September 2001
Topic *: "Analysis of Poor Outcome Following Internal Fixation"*
Dr S Rajasekaran

Orthopaedic Research & Education Foundation, Patna, September 2001
Topic *: "Initial Management of Patients with Multiple Fractures"*
Dr S Rajasekaran

Continuing Medical Education Programme of Madurai Medical College, Madurai, 2001
Topic: "*Controversies in Intramedullary Nailing*"
Dr J Dheenadhayalan

Tamil Nadu Orthopaedic Association, Coimbatore, 2002
Topic: "*Open Subacromial Decompression and Rotator Cuff Repair*"
Dr J Dheenadhayalan

Poster presentation at SICOT Meeting, San Diego, USA, 2002
Topic: "*Open Subacromial Decompression and Rotator Cuff Repair*"
Dr J Dheenadhayalan

Continuing Medical Education Programme, Mysore 2002
Topic *: "Distal Femur Fractures"*
Dr J Dheenadhayalan

Continuing Medical Education Programme, Mysore 2002
Topic : "*Proximal Tibial Fractures*"
Dr J Dheenadhayalan

Asia Pacific Orthopaedic Association Sports Medicine, Singapore Oct, 2002
Topic : "Open rotator cuff repair"
Dr I Ramakanth Rao, Dr J Dheenadhayalan

Publications

"Postoperative Implant Failures And Nonunions - Where Lies The Fault?"
Recent Trends in Fracture Management, 2001. Edited by Dr. D.K. Taneja
Dr Farook, Dr.I.Ramakanth Rao and Dr S Rajasekaran

"Orthopaedic Management In Polytrauma Situation"
Recent Trends in Fracture Management, 2001. Edited by Dr. D.K.Taneja
Dr.S.Rajasekaran and Dr.I.Ramakanth Rao

"Proximal Tibial Fractures"
Recent Trends in Fracture Management, 2001. Edited by Dr D.K. Taneja
Dr S Rajasekaran and Dr.I.Ramakanth Rao

"Initial Management Of Patients With Poly Trauma"
Recent Trends in Fracture Management, 2001. Edited by Dr. D.K. Taneja
Dr S Rajasekaran and Dr.I.Ramakanth Rao

Courses

Super Speciality Fellowship in Spine Surgery - National Board of Examinations, New Delhi



In 2000 the department became the first and only unit in the country to be recognised by the National Board of Examinations for super-specialty training in Spine Surgery. The fellows are selected by an All India Entrance Exam conducted by the National Board and the two year course is open to both Orthopaedic and Neurosurgeons. The selected candidates has both clinical and research tasks along with the responsibility for maintaining accurate and systematic documentation of clinical cases. In the second year, hands-on surgical training is offered under supervision and guidance.

Dr. I. Ramakanth Rao and Dr. Yogesh K Pithwa are the current Spine Fellows.

Dr.S.Rajasekaran with Spine fellows

Ganga - Johnson & Johnson Spine Fellowship for Research in Spine Surgery



The unit's experience and vast clinical experience enables it to offer numerous fellowships in spine surgery. The departmental spine surgery offers the Ganga Johnson & Johnson Spine Fellowship for Research to neuro and orthopaedic surgeons who wish to pursue research work in the field of spine surgery. The fellowship was started after the visit of Mr. William D. Deanshyne, and Mr.Supratim Bose, Vice Presidents of Johnson & Johnson (a Hongkong).



The Ganga and Johnson & Johnson Team during the visit of vice Presidents Mr. William D. Deanshyne and Mr. Supratim Bose

Trauma Fellowships



The unit's rich experience in trauma has led to research in various topics of orthopaedic trauma such as primary closure of open injuries, primary bone grafting, concomitant bone transport after immediate flaps. The department offers the Ganga Trauma fellowship enable young surgeons to pursue research activities in trauma and also gain valuable experience in trauma management. The trauma fellow is primarily responsible for accurate documentation and record maintenance of the large number of trauma victims. The 1year trauma fellowship receives ample funding and has performed important research on various management options in the fields of open injuries of limb and interlocking nails since 1995.

Dr. J.Naram Babu and Dr.B.C.Bhanuprakash are the current trauma fellows.



Dr.P.Chitteka Kumar Tyl Trauma Fellow



Dr. J.Dheenadhayalan with trauma fellows

World-Orthopaedic Concern - Sulzer Fellowships in Orthopaedics, Trauma & Spine Surgery



The hospital is a Training Centre recognised for the WOC-SICOT and WOC-Sulzer Fellowship. The department is recognised for fellowship training programs in surgery sponsored by the World Orthopaedic Concern in the fields of General Orthopaedic Surgery, Advanced Trauma Surgery and Spine Surgery. Selected candidates are awarded a travel grant and subsidised accommodation. The candidates are properly trained in the use of implants and instruments as a wide variety of surgeries in the field of trauma. In the fellowship period of 6 weeks, the fellows take active part in the outpatient department, ward rounds, clinical teaching and surgical sessions.



DR. DE SHENG ZHAO Consultant Orthopaedic Surgeon Tumor and Hospital, Tian Jin, China

Orthopaedic Technician Course



The Orthopaedic Technician Course trains two candidates every year. The curriculum involves lectures and demonstration classes in Anatomy, Physiology, basic sciences and relevant aspects of orthopaedic diseases. Practical training is provided on the technique of plaster application, immediate management of the injured patient in the casualty, the basics of preoperative assessment, operating theatre procedures, autoclaving and operating theatre techniques and procedures. In the year 2001, WOC, UK sponsored her Strat Gopal Course from Addis Ababa, Ethiopia for training for 1 year.

Dr.J.Balaravikuttalamoorthi explaining the finer points of plaster application to Mr.Sisay Gupta from Addis Ababa, Ethiopia who is undergoing training



Dr.J.D.Dhanmugambabu Chairman presenting the graduation certificate to Mr.Sisay Gupta

Trauma Nursing Course



Ganga Hospital started an unique course in Trauma Nursing in 2001 to train two candidates every year. The course has been started recognising the fact that nursing patients with major injuries requires special skills and techniques. The students are taught the theoretical aspects by both the surgeon and the anaesthesiologist and undergo practical training in casualty, ward, intensive care unit and operation theatre. The one-year course comprises six rotas consisting of postoperative patients, immediate care of the injured and basics of surgical procedures. Great emphasis is also given to preoperative and postoperative management of injured patients. In 2002, the course was upgraded to a two year course in Trauma Nursing. On completion of the course, the candidate has 100 hours of teaching in basic sciences at PSG Institute of Medical Sciences and Research, Coimbatore.

Dr.R.Sridhar K

Physiotherapy Trainee



The department of physiotherapy offers training to candidates from R V S College of Physiotherapy & Chetan College of physiotherapy. The physiotherapy department of Ganga Hospital plays an essential and integral part in bettering the results of surgery and providing good functional outcomes. The department is well-staffed with 8 full-time physiotherapists and 2 physiotherapy assistants. The unit is well-equipped with modern facilities like continuous passive motion machines for the knee, ankle and elbow and equipments like short wave diathermy, ultrasound, TENS for conservative therapy for patients with low back pain and other joint disorders.

Physiotherapy staff

Conferences Organised

ICSS-I
International Course on Spine Surgery 11-12 Jan 1994 SITRA Auditorium, Coimbatore

International Faculty
Mr.Gordon Findlay
Prof.J.Y.Lasenec
Dr.S.S.Upadhya
Mr.Nick.M.Valentine

National Faculty
Prof.A.Gupta
Prof.P.K.Zore
Prof.V.T.Ingalhalikar
Prof.K.Sriram



Prof.T.K.Shanmugasundaram lighting the lamp to inaugurate ICSS - I

Mr.Findlay, UK, discussing the techniques of pedicle screw fixation on bone models

ICSS-II
International Course on Spine Surgery 19-21 Jan 1996 SITRA Auditorium, Coimbatore

International Faculty
Dr J.Y Lasenec
Mr A.J.P Rigby
Mr Jeremy Fairbank
Dr John S Thulgard
Dr Subodh Saporia
Mr Ravindra Somashekhar
Prof T.A Lazarij
Dr Louis Montiforo

National Faculty
Prof T.K Shanmugasundaram
Dr V T Ingalhalikar
Dr K.Rajagopal
Prof P S Ramani
Prof S P Mohanty
Dr Ashok N Johari
Dr Shekhar Bhojraj
Dr Subba Rao
Dr R Prabhakar



Dr V T Lazenec, Poona explaining the intricacies of pedicle screw instrumentation to the delegates

ICSS-III
International Course on Spine Surgery 14-16 Aug 1998 Hotel Residency, Coimbatore

International Faculty
Dr.Anthony T Yeung
Dr.Henry Haines
Prof.Kazuo Tamita
Dr.Manohar M Panjabi
Dr.Ian Harding
Dr.Chris Lorenzo Ooi
Dr.Sanguyia D K
Prof.Sethi S Nangaharry
Dr.Sivanathan K S
Dr.Tushar Ch Patel
Dr.Wong Hee Kit

Indian Faculty
Dr.Ashok N Johari
Prof.Ingalhalikar V T
Prof.James Granadoss
Dr.Purbhkar J K E C
Dr.S.Rajasekaran
Dr.Sridhar K

Prof. V.T Ingalhalikar actively discussing with delegates

Conferences Organised

ICSS-IV
International Course on Spine Surgery 4-6 Aug 2000 Hotel Residency, Coimbatore

International Faculty
Prof. T.CHUNG
Mr. G.FINDLAY
Dr.Kent Samuelson
Prof. JOHN C.T.LEONG
Dr. DILIP SENGUPTA
Dr. E.ASHWOOD
Dr. VIOLA BULLIWAN

National Faculty
Dr. S.RAJASEKARAN
Prof. G.D.SUNDARARAJAN
Dr. SENKUMAR
Dr. ARVIND JAISWAL
Dr. S.PONNUSAMY
Dr. ASHOK JOHARI
Dr. SAJAN HEGDE
Prof. A.GAJARAJ
Dr. SAMEER DALVIE



Prof. E.TCHUNG Korea conducted a live surgical workshop on Anterior cervical VI spondylodiscectomy



Cadaver dissection at the conference workshop

Indo - German Orthopaedic Foundation Annual Conference
22&23 Jan 2000

International Faculty
Prof. Dr. M.WITSCHLER
Dr. H.G.HERKNICHEN
PD. Dr. S.TRAEDER
Prof. Dr. R.CLAUS
Prof. Dr. H.J.WILLBEARER
PD. Dr. T.SIEBEL
Prof. Dr. H.OEHRTZSCH

National Faculty
Dr. S.RAJASEKARAN
Dr. S.K.S.MARYA
Dr. J.DHEENADHAYALAN
Dr. G.BOOMA
Dr. SURYANARAYANA



Prof. Dr.SHYOLOR President - IGOF delivering the Presidential Lecture



Prof.W.Hong-Hee Kit of National University of Singapore delivering the Guest Lecture



Prof.R.Mangharam explaining the art of total knee replacement to delegates at the conference workshop

Knee Course
International Course on Total Knee Replacement 24 - 26 July 2001

International Faculty
Dr.K.M.SAMUELSON
Prof. Dr. WOLF K.CHUNG
Prof. DR. RAY RANDLE

National Faculty
Dr. S.RAJASEKARAN
Dr. J.DHEENADHAYALAN
Dr. G.S.KUKKARNI
Dr. JAGWANT RAI
Dr. S.VINAY
Dr. S.V.RAJAN
Dr. S.K.S.MARYA
Dr. P.SURYANARAYANA

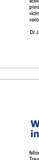
Dr.Kent Samuelson inaugurating the Ganga Knee Joint Replacement Training Centre



Prof. Wolf K.Chung of Australia at the active hands-on workshop session with delegates

Conferences Organised

ICS - 1
Instructional Course on Spine Low Back Pain 6 & 7 April 2002



Dr Tan Seang Beng of Singapore General Hospital delivering a Guest Lecture

Faculty
Dr Tan Seang Beng
Dr. Ashok N Johari
Dr.Murugan
Dr Ajay Prasad Shetty
Dr S Rajasekaran



Active participation by delegates

ICS - 2
Instructional Course on Spinal Deformity 7 & 8 Dec 2002



Prof.Wong Hee Kit of National University of Singapore delivering the Guest Lecture

Faculty
Prof. Wong Hee Kit
Dr Ashok N Johari
Dr Shekar Y Bhojraj
Dr.S.Rajasekaran
Dr. Ajay Prasad Shetty
Dr.Gowtham Zaveri
Dr.Abhay Nene



Active pre-conference discussion by the faculty

Forth Coming Events for 2003

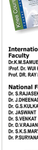
NATIONAL TRAUMA MANAGEMENT COURSE
22 - 23 APRIL 2003



ASIA PACIFIC ORTHOPAEDIC ASSOCIATION - FIRST CONFERENCE ON TRAUMA
25 -27 APRIL 2003



GANGA HOSPITAL - ALUMNI ASSOCIATION Inauguration in APRIL 2003



Combined Instructional Course on Spine Surgery
9 -10 August 2003. Organised by Ganga Hospital, The Surgeons of India & Spine Surgeons of Europe. Hosted by Ganga Hospital

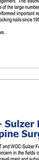
Visitors

Prof. W.WITSCHLER Germany



Prof. JOHN C.T LEONG Hong Kong

Prof. D.HOENTSCH Germany



Prof. Wong Hee Kit Singapore

Dr. WOLF K. CHUNG Australia



Mr.William S.Deanshyne Johnson & Johnson, USA

Dr.TAN SEANG BENG Singapore



Mr. G.FINDLAY U.K.



Prof. CHUNG Korea

PD. Dr. D.TRAEDER Germany

Prof.Dr.R.MEISSERBIER Germany

Dr. DILIP SENGUPTA U.K.

Dr. RAY RANDLE Auckland

Dr.C.B. Ashwathaw USA

Dr. ANTHONY T YEUNG USA

Dr.DIRSO LORENZA OSTI Australia

Dr. Ephaar U.S.A.,

Prof.Y.T INGALHALIKAR Thane

Prof. A.SRIRAM Chennai

Dr. RAJASEKARAN Former President, National Board of Examinations, New Delhi

Dr. ASHOK JOHARI Mumbai

Dr. D.ZAVERI Mumbai

Dr.SHEKAR Y BHOJRAJ Mumbai

Prof. G.S Kulkarni Pune Indian Orthopaedic Association

Dr. ARVIND JAISWAL New Delhi

Dr.S S UPADHYAY Hong Kong

Mr. EAIN FINDLAY U.K.

Mr. ANDREW FROST U.K.

Prof. T.K.SHANMUGASUNDARAM Chennai

Prof. A.GAJARAJ Chennai

Prof. SUDHIR BABHULKAR Nagpur Indian Orthopaedic Association

Dr. SUTHERLAND Australia

Dr. MANOJ KRISHNA, U.K.

Dr. T.K.SUNIL, Bangalore
"This hospital is a Temple of excellence"

Dr. HENRY HALMS Germany

Dr. JOHN KEKIA
"I cherish my time here for stimulating my thinking faculties for 16 hours a day... everyday. For the attitude or the conviction be sold at the hospital."

Dr. M.MANOHARAN, Sri Lanka
"Excellent Orthopaedic Hospitality"

Dr. K.B.MUKHERJEE, New Delhi
"Best training surgeons & facilities – an institute of national pride"

Dr. MEAR A. DAR, Jammu & Kashmir
"I enjoyed an extraordinary academic and research activities and professional experience. Ganga Hospital is a unique right from team-knit-nurses, support staff to surgeons"

Dr. VINOD KUMAR, New Delhi
"I have really received the best of care of orthopaedics, the real spirit of good and hard work for the ultimate benefit of the patient"

Dr. TAPAN BANERJEE, Jaipur
"A splendid experience of unlimited work culture, enormous clinical & academic work - watched & enjoyed every moment of my stay in the hospital."

. . . They said

Dr. T. SEWEL, Germany
"A rich wish a great experience"

JOHN C T LEONG, Hongkong
"Great honour and pleasure to be invited & to see this clinical unit and research work"

Dr.D.HOENTZ Germany
"Thank you for the staff up in Europe"

WILLIAM DEARSTYNE - Johnson & Johnson
"Ganga Hospital is a unique commitment to microsurgical & orthopaedic excellence & your outreach to the community"

Dr. VIJAY NARUD, Dr. ALMEIDA, Srilanka
"Excellent standard service in orthopaedics"

DR PRASADANNA SINHA KOA TRAVELING FELLOW
"This hospital is an extraordinary entity of infrastructure based on the foundation of dedication discipline, organisation, teaching, research and innovation & zeal"

Prof. S.M.TULI, New Delhi
"Ganga Hospital is a young enthusiastic orthopaedic surgeons working to serve, analyse, improve, publish and service better".

Dr. DAYYALAKONDA, Bangalore
"An island of excellence, I am sure this will be a role model for many more such centres throughout the country"

Dr. EDWARD T. WAK, Australia
"I am impressed by the high level of patient care offered by your hospital"

Prof. JASWANT RAI, Chandigarh
"The quality of work being done in this institute is highly impressive"

Dr. ARUN MULLA, Mumbai
"Excellent ratings and service"

Dr. VINOD KUMAR, New Delhi
"I have really received the best of care of orthopaedics, the real spirit of good and hard work for the ultimate benefit of the patient"

Reaching Out To The Community

Each man owes a debt to society, for it is the community and society that sustain him. Ganga Hospital realises the need to play a pivotal role in nurturing a healthier society. Towards this end, it has initiated a number of community service programs aimed specifically at the under-privileged sections of society. These projects have greatly benefitted needy families from these sections.

Project Helpline : 'Help For The Helpless'

Physical deformity in a growing child is more than just a physical disability. It is a major disaster not only for the child but for the whole family. These deformities cause psychological disturbances in the child and also cause a serious setback to their mental development. Deformities may be a result of birth disorders, accidents, poorly treated infections or inadequate nutrition. Unfortunately more than 90% of these deformities affect children from the lower socioeconomic group, whose families can hardly afford the treatment of these complex problems.

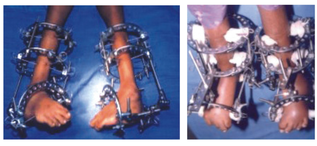


Realising this problem, the Orthopaedic Unit of Ganga Hospital has joined hands with Coimbatore City Round Table 31 to provide free treatment to such children. Surgeons treat these children free of charge and the hospital subsidises the treatment by more than 60%. The bare cost of the materials used is met by CCRT 31 and the charitable fund of the hospital. A wide range of deformities such as clubfoot, scoliosis have been treated under this project. About 100 children are operated every year and this project has been awarded the National Award of Round Table, India for the best community project

"Visiting your hospital & seeing your helpline project made me believe in God (for a person who is a non believer). God resides ..... not in our imaginations, but in the good intentions of people like you"

Suhasini Maniratnam
Film Director & Social worker

Clubfoot Correction





Rotary Road Accident Helpline Centres of Ganga Hospital

Ganga Hospital, in association with Rotary District 3200 has started Accident Helpline Centres at Mavuthampathy near Walayar and Kanjikode near Palghat. The aim of these centres is to provide immediate aid to accident victims and transport them in the Ambulance to an appropriate hospital. Ambulances are stationed at both these centres which are manned round-the-clock by the paramedical staff of Ganga Hospital.

Accident & Emergency - First Aid Care Project

Ganga Hospital in association with Rotary District 3200, launched the Accident & Emergency First Aid Care Project on 9th November 2001. District Governor, Rtn. MPHF. K.A.Kuriachan & Sri. Narinder Pal Singh, IPS, Commissioner of Police, Coimbatore City, inaugurated the project. Dr. S.Rajasekaran is the District Chairman and Dr. J.Balavenkatasubramanian is the Project Coordinator. The aim of this project is to teach first aid measures to 10,000 people in the year 2001, from all walks of life like school children, police, college students, bank officials, drivers etc.



Dr.Balavenkatasubramanian, Project Coordinator - demonstrating Cardio -pulmonary Resuscitation to Rtn.Kuriachan, District Governor, Rotary District 3200

Free First Aid Care Centre with St. John's Ambulance Services, Tirupur

Ganga Hospital joined hands with St. John's Ambulance services to start a centre for free first aid at Tirupur on 27th May 2001. Mr.Santhanam, IAS, District Collector, Coimbatore, Mr.Radhakrishnan, Member of Parliament, Dr. J.G.Shanmuganathan, Chairman, Ganga Hospital and Mrs.Vimala Ramalingam, General Secretary, SJAA, were present on the occasion. The centre aims to provide emergency first aid care and ambulance service to transport the traumatised patient as quickly as possible to the parent centre. Since its inception in June 2001, 3963 cases have been attended to, of which 201 cases underwent life or limb saving surgery. All the cases are attended to free of charge and services are provided 24 hours a day, throughout the year.

GAINS (GANGA ACCIDENT INSURANCE SCHEME)

This scheme, initially brought about by the cooperation of Ganga Hospital and Oriental Insurance Company Ltd. was formally inaugurated by Mr. K.Radhakrishnan, IPS, Commissioner of Police and Mr. S.V.Balasubramaniam, Chairman, Bannari Amman Group of Companies. This scheme registered 2232 members. A new scheme at a still lower premium was started on 25th Dec. 2001 in association with National Insurance Company, for which a total of 554 people have already registered. For a nominal premium these schemes cover hospitalisation and medical expenses, provide cover for disability and also offer 1% of the insured amount for every week the insured is away from work.

GAINS

GANGA HOSPITAL BLOOD BANK

The hospital has a 24-hour Blood Bank with all advanced facilities for safe blood donation and transfusion. The blood bank meets the requirements of and offers services to all hospitals of the region. The Blood Bank is about to be upgraded to a regional blood bank centre after which it will provide service to a larger area. The bank is supervised by 4 medical officers, an administrative officer and 5 transfusion technicians.





Board of Directors



Dr. J.G.Shanmuganathan
Chairman



Mrs. Kanakavalli Shanmuganathan
Managing Director



Dr. S.Rajasabapathy
Director



Dr. S.Rajasekaran
Director



Mrs. Nirmala Rajasabapathy
Director



Mrs. Rama Rajasekaran
Director

Present Team 2003

Department of Orthopaedic Surgery

Director & Head	- Dr. S.Rajasekaran
Consultants	- Dr. J.Dheenadhayalan - Dr. Ajoy Prasad Shetty
Senior Registrar	- Dr. S.R.Sundararajan
Registrar	- Dr. A.B.Rajendra Babu
Spine Fellows	- Dr. I.Ramakanth Rao - Dr. Yogesh K Pithwa
Trauma Fellows	- Dr. J. Naresh Babu - Dr. B.C. Bhanuprakash
Tutor in Orthopaedics	- Dr. Shashi Kumar - Dr. Dhanasekara Raja - Dr. Mubarak Ali - Dr. B.Chandrashekara
Dip. NB Post graduates	- Dr. Poornanand - Dr. Nagaraju - Dr. Divakar Raju - Dr. Uday Kiran - Dr. Ramalingam - Dr. B.R.W. Armstrong

Department of Plastic, Hand & Microsurgery

Director & Head	- Dr. S.Rajasabapathy
Consultants	- Dr. Ravindra Bharathi - Dr. Hari Venkataramani
Registrars	- Dr. Deepak Gowda - Dr. Sandeep Sebastian - Dr. Balaji

Department of Anaesthesiology

Consultants	- Dr. V.Ravindra Bhat - Dr. C.Sekar - Dr. J.Balavenkatasubramanian
Registrars	- Dr. S.Maheshwari - Dr. Venkatesh