4\textsuperscript{th} HM Patel Memorial Lecture

\textbf{Surgical care in India – \\ A Purely Personal Perspective}

by

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Charutar Arogya Mandal

Karamsad - 388 325

\textbf{November 30, 2008}
I am grateful to the Chairman and Committee of Charutar Arogya Mandal for conferring on me the honour and privilege of delivering the 4th H.M. Patel Memorial Lecture. It is not just with pride but also with a great deal of emotion that I stand here today, for I held Mr. H.M. Patel with respect, admiration and affection as a mentor and leader.

As befits a scion of the old I.C.S. cadre he exuded dignity with grace, mind with heart, efficiency without pomposity, wisdom with humour, the utmost integrity without heeding the consequences, the highest achievement with humility and the mischievous glint in his eye, self-depreciating, as if asking “who me’???, whose every word was well measured, well chosen, well worth remembering.

H.M. Patel has left several landmarks as testimony to his labour, his love, his life. This Institute we are gathered in today is one such notable landmark, built by him, brick by brick, with unwavering determination, in the face of overwhelming odds, collecting funds, overcoming officious road-blocks, slapping, as it were, the mortar and cement on his bricks with his hands as a labour of love and service to his community. It is gratifying to see his daughter Amrita continue tirelessly to add bricks, mortar and cement to her father’s dream.

As he sat on his rocking chair, drink in his hand in his daughter Sharad’s apartment in Mumbai, the subject of Surgery in India
would often crop up. I offer to you this purely personal perspective of surgery in India as my tribute to H.M. Patel and trust he will accept that what the talk lacks in stastics, exactitude and erudition, in small measure, it compensates in sincerity.

Of all the forms of inequality, discrimination and injustice in health care is the most shocking and inhumane - *Martin Luther King, Jr.*

**POWER POINT 3**

**IN THE BEGINNING:**

India is the cradle of world surgery. The first established and documented surgical school was on the banks of the Ganges river at Kasi (now Varanasi) between 800 B.C. and 600 B.C. Sushrutha, the father of surgery embodied its teachings in the monumental treatise on surgery the Shushruta Samhita.

**POWER POINT 4**

which is acknowledged and referred to repeatedly for centuries in Arabic and Greek surgical works.-Medical knowledge - (Ayurveda, science of life) as described in the Rig Veda comprises of eight divisions, of which surgery (Satyatantra) is the first and most important. In his text Shushruta stresses the importance of knowledge in all other branches of Ayurveda for proficiency in surgery, as they are inter-related. Shushruta’s definition of health cannot be bettered - “a state of physical and mental well being brought about and preserved by the maintenance of humours, good
nutrition, proper elimination of waste products and a pleasant harmony of the body and the mind”.

Stressing the importance of anatomy, learnt from cadaveric dissection (the first such description in literature) Shushruta describes a large number of operative procedures which cover among other headings excision, puncturing, exploration, extraction, evacuation and suturing. These procedures covered several current “specialities” like trauma, obstetrics, ophthalmology, ano-rectal surgery, plastic surgery (which included release incisions, rotation flaps and pedicle flaps as used in his procedure for rhinoplassty).

**POWER POINT 5**

To perform these procedures he devised, described and used over one hundred instruments.

**POWER POINT 6**

He encouraged his students, by their own experience and intelligence to devise and add new instruments to further facilitate surgical procedures, but emphasized that the best and most important “surgical instrument” is the surgeon’s hand. To attain proficiency, skill, speed and precision in surgical procedures Shushruta devised various experimental modules (fore-runners of today’s simulators) made out of vegetable and animal sources. Perhaps the most striking part of his Samhita is discipline in developing the character of his student surgeons to attain physical, mental, moral and ethical
perfection to maintain the sanctity of their profession.

Indian medical Schools stress the teachings of Hippocrates, Galen, Harvey, and others. It is, perhaps, a sad reflection on our psyche that earlier giants from our own past like Dhanvantari, Shushruta, Charak find scant mention, if any, in our Medical Schools.

**SURGICAL TRAINING IN INDIA**

Surgical training and education is the essential foundation of any Society’s Surgical Care System. The medical education system in India both at undergraduate and post-graduate level had its origin in the British medical education system in the mid 19th century, when four Medical colleges were established: Madras Medical College (1835), Calcutta Medical College (1838), Stanley Medical College Madras (1838), Grant Medical College Bombay (1845). Over the next century only 10 more Medical Colleges were added so that at independence from British rule in 1947, India with its vast size and population could boast of only 14 Medical Colleges. This was the nucleus from which the growth of surgical manpower over the next 60 years commenced. It would be apt to mention that the Association of Surgeons of India, founded in 1937, has played a strong and significant role in the growth of Indian surgery.

Over the last 60 years the total number of Medical Colleges in India has increased to 267 colleges with an annual total intake of 28,775 undergraduate students. This sharp rise in the number of Colleges appears impressive till one appreciates the population mass the medical profession needs to cover. The low doctor to patient ratio is further accentuated by
the fact that a large population of doctors is located in urban areas, the large population of India lives in rural areas. There were two areas of major concern in increasing the number of colleges after independence by 253 colleges. The first was the acute dearth of qualified, trained, motivated teachers to satisfactorily meet this sudden increase. The second was that this increase was not adequately supervised or credentialed so that there was marked disparity and variation in the end product from various Colleges. In spite of the obvious drawback of this rapid increase in Colleges, this increase was mandatory to try and cope with the enormity of the health care needs. The Bhore Committee, at the time of independence, and several subsequent Committee have tried to follow recommendations to cover the vast expanse of India and its masses by developing a Public Health System which was to be in three tiers - Primary Care in Primary Health” Centre (PHC) and in Rural Hospital, Secondary care in District Hospitals, and Tertiary care in Hospitals. Unfortunately there is a vast gap between planning and performance.

Medical education in India has two regulatory bodies for postgraduate education-Medical Council of India controlling both undergraduate and postgraduates medical education, recognition, de-recognition issues and license to practice, and the National Board of Examination running postgraduate medical education program of its own, similar to MCI in its content and duration, but mostly in Private Sector hospitals. For both, the surgical training program is similar and has not been changed significantly over several decades. The duration of the training program is for three years of rotating Residency. During this period it is customary though not mandatory to
have a six month Residency in any related sub-speciality e.g. plastic surgery, urology, oncosurgery, A & E services. The training curriculum is not one uniform, standard structured program. Each Teaching Hospital by and large implements its own syllabus, and training criteria with similarity in most aspects. However, the vigour of implementation, the expertise of instructors and the stimulus to excel varies in large measure in different Medical Colleges. There is one redeeming factor in Surgical Training in India which partly compensates for the variable teaching facilities and standards. This compensation which is uniformly available, in every single Teaching Hospital in the country, is the immense patient load, perhaps unequalled in any other country. Those who espouse the cause of ethics and morality would oppose the use of an immense patient load as a training module. However, the mass of surgical patients who demand treatment necessitates that the ultimate training area is the surgical ward and the Operation Room. One happy aspect of Surgical Training in India is that by and large the surgical trainee, exposed to an unending mass of poor patients acquires a sense of empathy and feeling not always seen in other countries.

**Challenges / Solutions to Surgical Training:**
There are several challenges to Surgical Training:

**SURGEON PATIENT RATIO**
The first and obvious challenge is the gross shortfall in the number of surgeons as related to the Indian population. Funding new Teaching Hospitals especially according to the mandatory MCI rules (10 acres of land, 7 free beds per student, etc.) is fast becoming financially impossible. After
Government resources dried a large number of Private Teaching Hospitals which pay for their expense by high fees from the student mushroomed, but even these are finding it progressively more difficult in view of raised salaries of staff and escalating cost of patient care for poor patients. To fill the gap a large number of Corporate Hospitals, and Trust Hospitals perfectly equipped and staffed as also other large Hospitals like the Railways, Armed Forces, Insurance hospitals, are rapidly increasing in number. If the potential of all these hospitals was tapped by recognizing these hospitals to admit surgical trainees, the number of trainees would greatly increase. Of course one could reasonably expect and hope that the Governments annual budget percentage for health care be double from the current miserly 2.9% (about the lowest in the developing world) to atleast 6% which would add greatly both to patient care, improving existing Teaching Hospitals and the setting up of new Teaching Hospitals.

Two Regulatory Bodies:
There are two regulating bodies, for surgical training often pulling in different directions, with, on occasion, different levels of competence and transparency. To have the entire surgical training program under the aegis of ONE body with one uniform strictly implemented training program, syllabus, standards, and one examination conducted by this one regulatory body fairly and transparently all over the country would tone up and improve the entire training program even without any further embellishment or expenses.

Training Program unrelated to reality
By far the most glaring and to me inexplicable challenge is that the entire surgical training program and its duration is
directed to the practice of surgery in the urban setting. This is a sad paradox in a country where the large majority of the population live in rural India, where the surgeon out of necessity is called upon in addition to all general surgery, to treat a fracture, chest injury or ruptured uterus to name just a few situations. To meet this challenge all trainees should have at least one rotating posting in a peripheral District Hospital or Mission Hospital.

**Suggested Change:**

With current surgical advance a three year Surgical Training Program is sadly inadequate. A five year Program with more exposure to rural surgery to meet the needs of 70% of our population, with rotation in some speciality would ensure a better trained and more mature end product, better equipped to meet both the bulk of urban and rural patients.

5 year Surgical Training Program suggested:

6 Basic Surgical Training of three years for all:
7 months in General Surgery 6 months in A and E / trauma
6 months in elective sub-speciality 6 month district hospital
12 months in General surgery to include BSS, MAS, Communication skills, ATLS courses.

24 months further individually planned program for complete training in General Surgery, Rural Surgery or a speciality.

**Planning surgical manpower requirement:**

The curriculum and number of trainees should be need based, after calculating national and regional requirements. For example, India needs a vast manpower to address surgical needs of people living in small towns, districts and
in sub-divisional villages. How many General Surgeons should be trained and how many super-specialists and where, needs to be planned and decided according to local requirements, regions, and trained accordingly. There is general agreement that surgeons serving Districts, sub divisional towns and even small villages, need a separate training, covering wide spectrum of surgical capabilities to handle the wide varieties of routine and emergency surgical problems often encroaching other specialties like orthopaedics, E.N.T., gynaecology.

**The evaluation process:**
Progressive Competence-based training and in-training assessment process which is objective, measurable and valid should replace the current only one time examination after three years. Training in surgery has a special requirement of learning skills and technology - both of which need special attention for training and assessment. Simulators and surgical skill courses should be an essential and routine part of training for all residents. The Halstedian method of training should be complemented with gradual and progressive competence based training and assessed for competency suitable to the level of training on an ongoing basis.

**CURRENT SCENARIO OF SURGERY IN INDA**
The practice of surgery in any part of the world is but a reflection of the socio economic fabric, governance and commitment to social justice of any country. It is no different in India. India is the most perfect example of a country with the practice and picture of two distinctly different types of surgery - surgery in the islands of excellence represented by Corporate and Private Trust Mega hospitals as also in several good Teaching Hospitals in urban India, as contrasted to the
surgery in rural India, a difference I have heard referred to as Surgery in India in the cities and Surgery in Bharat in rural India.

**SURGERY IN URBAN INDIA:**

The tremendous height Indian surgery has achieved in its large Corporate / Trust Hospitals as also its major Teaching Hospitals places Indian surgery at par with surgery in any part of the world.

**POWER POINT 7**

These spectacular advances in every major speciality and subspeciality of surgery are a matter of great national pride. In step with surgical advance the new Corporate / Trust hospitals are constructed, equipped and functioning with the flavour or even opulence of the best centres in the world, with greater work load and comparable if not better patient outcome and satisfaction.

**POWER POINT 8**
Little wonder that India is fast becoming a hub in medical tourism, an industry which is growing at over 15% annually! The proof of the pudding is that even our politicians and other social aristocracy are now opting for their own surgery in their own country!!

**ROBOTIC RGERY POWER POINT 10**

The high level of surgical competence achieved in every surgical field in these urban institutions is by and far well known to all of us as every conceivable agency be it the government, the media, the surgical profession, industry is involved in a crusade to highlight our surgical prowess.

There are many who would downplay, even question the surgery as is done in our towers of excellence as inappropriate in our overall picture. I for one would vehemently support the rationale, impact and value of the surgical progress made, even if its benefits percolate to just a small percentage of the population. I feel that advance, in any field, has two dimensions-vertical and lateral.
To reach for the moon as Chandrayaan I has done is vertical advance, even when achieved in the face of inadequate roads, sanitation drinking water - the remedy for which would be my concept of lateral advance. Vertical advance gives a glow of pride, inspiration, achievement, which, even if of no substantial consequence to overall well being is a shot in the arm to a country’s soul. I am all for more Chandrayaan I - in every higher field of national endeavour, for this endeavour gives a sense of purpose, a source of upliftment to all Indians wherever. The Surgical excellence in Urban India is Indian surgery’s Chandrayaan I.

SURGICAL CARE IN RURAL INDIA

It would greatly boost our ego and feel good factor talking unendingly of the surgical success in all our urban areas. However does this high-tech, high-cost, richly publicized surgical achievement reflect the true level of surgical care in India? Regarding there being two types of surgical care, one for the rich and one for the poor, it would be the ultimate in hypocrisy to pretend otherwise. For that matter in large parts of India there is just no surgical care at all for the poor. No discussion on surgery in rural India can be meaningful without understanding the enormity of the problems faced.

It may well be asked what standing or qualification does a surgeon like me who has lived all his life working in a major city and its 5 star hospitals have to talk on rural surgery in India? Visiting rural centres a few days every few months over 25 - 30 years does not qualify me to be an authority on rural surgery. But I do have genuine commitment to surgery for the poor.
From 1963 to 1994 I had the privilege to work as an Honorary Professor of Surgery in one of the countries’ foremost teaching hospitals.

J.J. HOSPITAL

POWER POINT 12

It is there that I learnt that 40% of India’s urban population is in a state of deprivation and looking after the poor has the same problems whether it is in urban or rural environment.

POWER POINT 13

This is my ward at the J.J. Hospital in 1971 with patients in corridors, balconies, between beds.

POWER POINT 14

The funding was so depleted that it took days and weeks for a simple X-ray to materialize. Learning from Dr. N.D. Motashaw who introduced laparoscopy as a diagnostic modality in gynaecology, I felt it would be worthwhile introducing laparoscopy in surgery to hasten diagnosis and treatment and improve bed turnover. Interestingly laparoscopy came into Indian surgery not as a technological advance or to catch up with the West, but as a service to the poor.
I got this laparoscopy equipment from Tuttlingen in Germany in March 1972. I could not afford a gas insufflation machine so used a sigmoidoscope pump to create pneumoperitoneum space.

Improving on x-rays we had visual diagnosis as also biopsy diagnosis and with 5 - 8 'scopies every operative session could have a much better bed utilization.

This equipment was kept at the JJ. Hospital, used solely for 11 Hospital patients, and eighteen years later to our gratification we found that this so called “high-tech” equipment was wonderfully cost-effective for a poor patient load.

Cost-effective Diagnostic Laparoscopy

Equipment cost (In 1972) with
Repairs, replacements Rs. 94,000
Used from 1972 - 1990 for 3,100 welfare patients
Equipment cost per patient Rs. 30.3 ($0.60)
Equipment helped train over 90 residents, hold 67 workshops all over India and neighbouring countries
and when spread over 3000 patients the cost per patient was Rs. 30!!. [1]

Since 1975, in the course of dozens of workshops I travelled all over rural India as also neighbouring countries like Nepal, Bangla Desh, Myanmar trying to convince small town surgeons, where sophisticated diagnostic facilities were not available, of the benefits and utility of laparoscopy.

Since 1990, when operative laparoscopy started, that gave me fresh reason and opportunity to criss-cross rural India.

COST EFFECTIVE DIAGNOSTIC LAPAROSCOPY

Thanks to laparoscopy I was gifted the wonderful opportunity to travel and interact with surgeons in rural areas all over the country. Each visit I learned far far more than I taught
from the versatile rural surgeons. My commitment to rural surgery is not a new fad - it goes back over 25 years by organizing the first ever Symposium on Rural Surgery at a surgical meeting of this sub-continent in Kathmandu in 1983, giving both recognition and dignity to Rural Surgery.

The enormity of the Problem

The basic problem as also its solution lies in the quagmire of overall socio-economic growth and progress in India as all over the developing world. Health is just one aspect of this situation. The Preamble of the W.H.O. constitution states “the enjoyment of the highest attainable standard of health is one of the fundamental rights of every human without distinction of race, religion, political belief, economic or social condition”. How very trite and hollow these words sound to those who work in health care in the developing world. How depressingly different are the true facts. Surgery is but one facet of the total health picture.

POWER POINT 22

To get a factual concept of the real Indian picture I would strongly recommend this excellent book “Everybody loves a good drought” by P. Sainath

After eleven 5-year plans of our planning commissions and politics where do we stand? Government allocation for health is about 2% of our budget, our infant mortality rate is 72/1000 and maternal mortality rate 5/1000. Over
the last two decades there has been a perceptible trickling of health care to the poor, but we are still struggling to establish a chain of functional primary care centres where basic surgical care can be rendered, nowhere is there an adequate referral system to secondary care centres (which if present are poorly equipped and staffed) or to tertiary centres. It is unlikely that in the foreseeable future there will be a dramatic improvement in the government’s (genuine) commitment and involvement, because unlike caste or religion, regretfully, health is not a vote-bank. As long as the rich, the powerful, have access to five star public or private hospitals for themselves, their families and their proteges, there will be poor incentive to improve health at grass root levels inspite of all the preaching and protestations. Almost 70% of our health expenditure goes towards the 30% in urban India (New Delhi has far more C.T. scans and M.R.I, machines than all of Scandivenia!). By a cruel ironic fact, 70% of the Gross Domestic Product of India is generated by people in rural areas and the urban slums of our cities, who receive, at best, 30% of our health expenditure!!! About 20% of our country’s surgical work force live and work in rural India, in an endeavour to address the surgical needs of the 70% of our population, many of whom are poor, with no hope of surgical care. These surgeons work without basic civic infrastructure - power, water, sanitation, roads, and schools. Without recognition or financial security, without trained or qualified assistance, without adequate prior training and education in Medical Colleges to face the grim and diverse realities of coping with the heavy demands of surgery in all its variety in rural India, necessitating that they learn, as it were, on the job.
Ground Covered:

When I started Surgical Residency 52 years back, the surgeon working in rural India was a rare and remote figure who continued working under unimaginable odds with the demeanour of a masochistic martyr. Thanks to workshops in diagnostic laparoscopy and laparoscopic surgery I was gifted the wonderful opportunity to travel and interact with surgeons all over the country and have experienced the exhilaration of a wonderful metamorphosis in rural surgery unfold over the last three decades. This has albeit been facilitated by the considerable and heartening radical improvement in basic facilities in several areas of rural India, water, roads, electricity, communication, schools. I have invariably returned from these workshops inspired and made humble by the quality, range and dedication of today’s rural surgeon. The future of surgery in India as also of the surgical care of the poor lies in the proliferation, education, acknowledgement, recognition of this emerging genre of Indian surgeons who by dint of courage, capability, innovation, improvisation, sacrifice have given a new dimension and aura to Indian surgery. They are the unsung heroes of Indian Surgery. In an age where Professors in teaching institutions inculcate and urban surgeons in India stress the importance of sub and super specialization into pancreatic, rectal, breast and similar specialities ad infinitum, the rural surgeons have shown that for the vast majority of people and their problems the ultimate super speciality is general surgery. This rural super-specialist will trephine for an extradural after head injury, drain an empyema, suture a perforation, cope with a ruptured uterus, a compound fracture or a polytrauma. All this would be done with minimal diagnostic aid, perhaps sterilizing instruments
in water boiling over a kerosene stove, with an untrained anaesthetist using ether anaesthesia, with an unqualified nurse as his sole assistant, quite often with surgical gloves recycled repeatedly\textsuperscript{[3]}. And our City Professors insist we must practise ONLY Evidence Based Medicine!!! This is the picture of surgery for the poor in large parts of India. These rural surgeons are prepared to do this because they know they are the last bastion of the poor - beyond them there is no other succour. Their gains may be meagre but their joys and rewards are bountiful and they may well ask their urban colleagues, a question asked 2000 years ago - what avails a man if he gains the world, but loses his soul?

The heartening story is that with improvement in rural infrastructure, their fold is rapidly increasing giving us hope there is light at the end of the tunnel. These surgeons who now account for well over 20% of the Indian surgeon force are by and large self sustained or sustained by charitable institutions, with meager or no support from government agencies. With increasing numbers and a self-confidence arising of an awareness of their national importance these surgeons are gaining in strength, asserting themselves by having their own Associations, their own Conferences, and their own Journal\textsuperscript{[4]}. A reassuring factor is that small town surgeons have not depended on outside agencies to implement innovation, rather have engineered advances based actually on their own efforts and experiences. They are fighting their own battles. Time would not permit an account of the innumerable contributions of Indian surgeons towards care of the poor - the Jaipur foot, easy to fabricate, low in cost, light in weight, perfectly suited for Indian conditions is the most striking example. Starting from a 7-bed Mission Hospital tucked
away in a small town in Kerala a single surgeon took upon himself the task of curing infants and children of the stigma of cleft lip and cleft palate. Over a period of five decades the hospital has grown a hundred fold and he has single-handed perfected a technique over nearly 10,000 cleft lip and palate repair. Perhaps more important than the volume of work or the excellence of results is that almost every patient was treated at no cost to the patient with support from local, national and international funding bodies. Today this one time 7-bed hospital has grown hundred fold and draws both patients and surgeons from all over to benefit from its large volume, technical excellence and its missionary charity.

The care of the patient with burns has been simplified and made almost cost-free by various methods like self-care and potato peel dressing. Innumerable similar innovations, which can be seen in almost every Taluka in India, are not flashes of genius but the inspired result of innovation and ingenuity after working over many years under conditions of necessity and deprivation.

The bane of the rural surgeon is having to work without the luxury of assistance by any trained personnel. There are just no trained anaesthetists, pathologists, radiologists, nurses, paramedical staff. Any “specialist” city surgeon would be hard pressed to repair a simple hernia under such circumstances! The surgeon hence has to train the local family physician or villagers to perform some or all of these tasks. Even in this vital area there is a distinct improvement. So far these surgeons trained their own staff their own way. There is emerging an element of human resource development in rural surgery by establishing a structured and reproducible education module of didactic and practical training of various
levels of local “nursing” and paramedical staff depending on levels of previous education and practical competence\textsuperscript{[9]}.

Our medical education system needs urgent rethinking and revamping. One can never stress this lacuna often enough,\textsuperscript{[10]}.

It mimics established patterns from the developed world, where super and sub specialization is a norm if not a necessity. This inappropriate system relentlessly churns out specialists for a country where the need of 70\% of the people is for general surgeons. Residents and postgraduates are offered no experience, information or guidance in surgery in rural India so that even if they had the inclination, it would be difficult for them to enter a world of which they are clueless and ignorant. In the process “general surgery” is made to sound like an indecent term, whereas as the way it is performed in all its variety by the small town and rural surgeon, general surgery is in fact the ultimate in super specialization. This form of education where there is total disregard for reality and national interest needs urgent redress. Our educationists must accept that the West is not the source of all knowledge and learning. We must build bridges with our neighbours in South East Asia and our colleagues in Africa, who share our problems, to learn from each other’s experiences and innovations and make teaching appropriate to the workplace.

One national magazine annually publishes a list of the “ten best” medical colleges in the country. This list has not substantially changed over the last several years, showering accolades on institutions which excel in meticulously mimicking the leading teaching schools of the West, no matter if a large proportion of their Professors and students migrate en mass.
These leading institutions are the pride and frontiers of our medical education system, but in all these annual “Oscar” nominations I have never ever come across any mention of, leave alone credit to the very few medical colleges established in rural areas like Sevagram or Karamsad which endeavour to give medical students a realistic education to cope with Indian life. As important as basic postgraduate education for the rural surgeon is an ongoing programme on continuous surgical education and updating, for as a duty -to their patients rural surgeons, have, with discrimination, to integrate current advances into their rural practice.

The peer pressure from Departments of Surgery in their urban ivory towers is stifling to rural surgery. In several parts of India, laparoscopy is done with the use of atmospheric air I was doing so myself from 1972 to 1990. Adhering to guidelines formulated by Endosurgical Societies in the developed world these Professors and Heads of Departments frown severely on the use of air.

**TO BE OF PRACTICAL BENEFIT NEW TECHNOLOGY MUST BE**

- Affordable
- Acceptable
- Accessible
- Available
- Appropriate

**POWER POINT 23**

I have, for years advocated that for pragmatic progress in surgery in the developing world one must adhere to the concept of the 5 A’s - Available, Affordable, Accessible,
Acceptable and Appropriate\textsuperscript{[11]}. If for laparoscopic surgery CO\textsubscript{2} cylinders have to be transported several kilometers over rough terrain to refill and often return unfilled, the use of air would be available, accessible, acceptable, affordable, and hence appropriate. In response to a multi centre trial of a cheap indigenous material for hernia repair I published as Editor in the Indian Journal of Surgery, the Professor and Head of the Department of Surgery of a Postgraduate Medical Institute wrote me to express his annoyance that I published this work carried out in rural hospitals “without any prior animal toxicological study”!! Where do facilities for animal toxicology study exist - in a rural hospital or in a Postgraduate Teaching Institution? This form of hernia repair, on current evidence, may not be advocated for general use, but do we not owe it to the national interest to give it adequate trial? If our teaching hospitals would take time off reproducing, parrot-wise, research done in the west and divert their energies to more pertinent and pressing national priorities, these Departments could work in collaboration with the rural surgeon giving the innovations and “research” of rural surgeons a more “scientific” base. Research that duplicates studies and does not relate to the health priorities of developing countries is unethical\textsuperscript{[12]}. I was particularly distressed to receive this Professor’s letter of disapproval of this economical mesh repair because I on my part was wondering why National Awards are seldom given to innovative rural surgeons! Could this be because National Awards are usually recommended by politicians, industrialists and film stars, a group the rural surgeon is unlikely to treat? The Alma Ata report on primary health care emphasized research and evaluation by those providing the service\textsuperscript{[13]}. 
While the unavailability of modern technology has limited the scope of research in rural centres, it is still possible to conduct appropriate, “low-tech,” and relevant research that is subject to an excellent study design, proper controls, and scientifically valid interpretations[14].

Society must exert to enhance both the performance as also the accountability of the rural surgeon. However, it would be patently unjust and unfair to apply the same law for a large urban hospital as for a rural nursing home, cottage or mission hospital as exists now. For example there would be no option in rural India but to use unqualified nursing and paramedic staff to man laboratories, theatres, wards, x-ray departments, etc. If the same laws that apply to urban hospitals were to apply to rural India every one of these small rural centres would have to close down or their surgeons face imprisonment ensuring that the law would effectively and completely throttle what little surgical care we have for the poor at present. The judiciary needs to wake up to the reality of rural India and pass legislation to help not hinder health care for the poor, accepting that some care is better than no care at all.

GROIN HERNIA IN THE U.S.

- Open Mesh Repair 79%
- Laparoscopic repair 14%
- Tissue repair 7%

S.C.N.A. 2003

Tissue repair is the commonest repair in developing countries because of the unaffordable cost of commercial mesh.
POWER POINT 24

Preliminary Multicentric Trial of Cheap Indigenous Mosquito-Net Cloth for Tension-free Hernia Repair

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Abstract

Today world over tension free mesh repair for hernia is the method of choice for adult groin hernia and almost all incisional hernias. Synthetic mesh for her hernia repair available in the market is effective, but is very expensive particularly for the poor population in the rural area. It was observed that the ordinary mosquito-net cloth looks and feel quite like a polypropylene mesh and it was thought that its use instead of a standard marketed synthetic mesh could be of significant cost advantage. This net is made of copolymer of polypropylene and polyethylene and can be sterilised by autoclaving. This study analysed the multicentric experience of using the mesh made of the mosquito-net since 1995.

TONGAONKAR SLIDE

POWER POINT 25

It is a tribute to the enterprise, innovation and courage of rural surgeons in India who started the use of cheap indigenous mosquito net to give their poor patients the benefit of the “evidence based” mesh repair for hernia accepted as the “gold standard” all over the world.

POWER POINT 26

Convinced of the sincerity and integrity with which the rural surgeons are reporting this work I have started a controlled clinical trial of this method in Mumbai, with Ethics Committee
Approval and detailed informed patient consent.

**POWER POINT 27**

*Autoclave sterilized*

**POWER POINT 28**

The Mosquito net has been evaluated in the Research Department of the Commerce and Industry Ministry.

**MESH COMPARISON**

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<tr>
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<th>MOSQUITO NET</th>
<th>COMMERCIAL MESH</th>
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<tbody>
<tr>
<td>Chemical</td>
<td>Polyethylene - co-propylene</td>
<td>Polypropylene</td>
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<td>Melting Point</td>
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<td>150o</td>
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<td>Thickness</td>
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<td>0.46</td>
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<td>Density (Weight)</td>
<td>63g/sqm (Medium)</td>
<td>95g / sqm (Heavy)</td>
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<td>Diameter (Fibre)</td>
<td>0.166</td>
<td>0.149</td>
</tr>
<tr>
<td>Break Load (Tensile)</td>
<td>126 Newton</td>
<td>12 - 16 kg / cm</td>
</tr>
<tr>
<td>Autoclaveable</td>
<td>Yes</td>
<td>Pre-sterilized</td>
</tr>
<tr>
<td>COST</td>
<td>Rs. 0.40 paise</td>
<td>Rs. 1,850/-</td>
</tr>
<tr>
<td></td>
<td>$ 0.01 cent</td>
<td>$ 37/-</td>
</tr>
</tbody>
</table>

**POWERPOINT 29**

and is found to be very similar in all chemical and physical aspects to commercial mesh but for One factor - cost. The cost of mosquito net is Rs. 0.40 p per patient as compared to Rs. 1,800 of the cheaper commercial mesh.
The cost difference of one repair may not appear great, but it is estimated that well over one million hernia repair are required to be done in India every year - then the cost difference would be staggering!!

<table>
<thead>
<tr>
<th></th>
<th>MOSQUITO NET</th>
<th>COMMERCIAL MESH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cases</td>
<td>36 cases</td>
<td>43 cases</td>
</tr>
<tr>
<td>Normal activity</td>
<td>≈ 6.5 days</td>
<td>6.3 days</td>
</tr>
<tr>
<td>Return to work</td>
<td>14 days (7-28 days)</td>
<td>14.4 days (11 -24 days)</td>
</tr>
<tr>
<td>Sensory Loss</td>
<td>8 cases / 3 weeks</td>
<td>9 cases / 3 weeks</td>
</tr>
<tr>
<td></td>
<td>3 cases / 3 months</td>
<td>4 cases / 3 months</td>
</tr>
<tr>
<td>Recurrence</td>
<td>Nil</td>
<td>Nil</td>
</tr>
<tr>
<td>Total COST of Mesh FOR ALL CASES</td>
<td>Rs. 20/- For 39 procedures $ 0.40 cents</td>
<td>Rs. 88,000/- for 44 $ 1,766/-Rs. 451,000/- for 44 $ 9,020/-</td>
</tr>
<tr>
<td>ratio: 1: 4,400</td>
<td>1:22,500</td>
<td>Polypropylene Ultrapro</td>
</tr>
</tbody>
</table>

**MOSQUITO NET V/S COMMERCIAL MESH**

**POWER POINT 30**

At the term “Mosquito net”, most Herniologists seem to look down their nose in amusement. The term “Mosquito-net” should hence be replaced by “cheap alternate mesh”.

**POWER POINT 31**

COST RATIO

1: 4,400
1: 22,500

There could soon be a reversal of technology transfer from “poor?” to “rich?” countries to practise cost effective “patient oriented” procedures rather than “manufacturer oriented” procedures. “The Roman Empire crumbled under the weight of its own prosperity”.
Since 1991 I have been using as dressing for infected wounds a method derived from the teachings of Shushruta, taught to me by Dr. Gadvi a surgeon Sanskrit scholar from Saurashtra working in a small town in Kenya when I was visiting that country to demonstrate laparoscopic cholecystectomy.

This dressing made out of ghee and honey has been used in all Hospitals in Mumbai I was and am working in [15].
I am convinced of its efficacy, as of course are scores of grateful patients. When I mention this cheap, simple dressing to my sophisticated colleagues they look at me with tolerant humour as if to say “here comes our crazy old Bawaji again!!!”

**Two thoughts arise from this:**

We work in a milieu that bows to the dictates of “Western Medicine”. Evidence obtained from centres like Mayo Clinic, Cleveland Clinic, Massachusetts General Hospital goes into defining Evidence Based Medicine to which it is mandated we must faithfully, blindly and dutifully adhere. Evidence Based Medicine has several advantages. However, abjectly, unthinkingly and spinelessly kneeling at the alter of Evidence Based Medicine inhibits surgical initiative, congeals the courage to try something new one believes in, dampens the urge to push the edge of the envelope. Can we not create an evidence based medicine which could not only apply to but also encourage innovation in the conditions applicable to rural India?
Dr. Gadvi sadly passed away in a road accident in Kenya a few years back. A surgeon Sanskrit scholar is no more. The Sushrutha School of surgery evolved over centuries. Can this country not generate the funds and the pride for a Foundation which will study; scrutinize and translate the gems of medical thought lying buried in our past? Certainly we surgeons should turn to Conferences, journals, the internet for future progress, for our thrust should be to reach for the stars, but would that be enough reason to ignore and disown our treasures of the past from which we could possibly derive a wealth of “new medicine”??

Surgery is above all a humanitarian science. One has to stress an aspect of surgery which has nothing to do with diagnosis, technology, operations.

AMBROISE PARE

Ambroise Pare who placed surgery in its correct perspective when he said “I dressed his wounds, God healed them”, was the Royal Surgeon of the Monarch of France in 16th century. He once aroused the anger of his Monarch by keeping the ‘ Monarch waiting.

“You will treat your King better than your patients!” said the Monarch “I can’t my Lord, I can’t” replied Pare “Why can’t you?” demanded the Monarch “Because, My Lord, I treat them all like Kings and Queens”

Ambroise Pare 1550

WITH CHEAP TECHNOLOGY LET US TREAT ALL OUR PATIENTS EQUALLY, IN ALL PLACES.
The future belongs to those who believe in the beauty of their dreams
- Eleanor Roosevelt

Like all of you I too have my beautiful dreams.

Surgery is but a small part of a country’s functioning. The most important dream is to realize a massive elevation of the quality of life for the poor and disposed where there is instead of a widening of the disparity between rich and poor as we see today, the gap narrows and narrows. This dream, as Barrack Obama would say has the super audacity of super hope. This would need excellent governance, total emphasis on the basic infrastructure of any economy - roads, schools, safe water, preventive medicine, primary health care, employment, practical technology, and most important, stamping out the rampant heartless corruption which perpetuates our vandalizing the poor. It needs a new comprehension on the part of the rich to realize that they owe a national responsibility, follow J.R.D. Tata’s philosophy that what you have taken from the people must, in large measure, go back to them. It needs self questioning, belief in the universal brotherhood of mankind. When I stop dreaming I realize to bridge the gap between the rich and poor, to raise the poorest to an acceptable lowest common denominator may take much more than governance and good will - it will need an Act of God. If we have the will and motive, perhaps God will be with us.

The surgical care for the poor is an uphill and herculean task,
yet a task worthy of every ounce of our collective effort and energy. No one person, no one country can have the answers. It is vital all surgeons from all spheres of activity in the developing world from Professors to village doctors, as also those from all developed areas, pool their concerns in this effort. If success is defined not by what one has attained but by the effort made in overcoming obstacles, just our sincere efforts in this cause would be by far the greatest triumph, the ultimate success story in the art and science of surgery - to ensure basic surgical care for all the poor.

Ladies and Gentlemen, surgeons are born egoists and progressively grow more so!!. There is always a very real danger that we surgeons may take ourselves, our prowess and our technology far too seriously. There is an anecdote recorded in the annals of the 250 year old Bombay Asiatic Society which always helps me cut myself down to size. It would appear that Mark Twain, one of the first guests of the Taj Hotel, while visiting Bombay early last century was involved in an erudite discussion and debate on the validity of Darwin’s theory of evolution. When he could stomach this learned repetitive discussion no longer, Mark Twain stood up and ended the debate “Ladies and Gentlemen, there is no way man could have descended from the monkey. I have it on good evidence that God created the monkey later, because He was disappointed with man”.


POWER POINT 41

REFERENCES:

BRIEF BIO-DATA

PROFESSOR TEHEMTON ERACH UDWADIA,
OBE, MS, FCPS, FRCS(Eng.), FRCS(Edin.), FACS, FICS (Hon.),
FAMS, FARSI (Hon.) Emeritus Professor of Surgery, Grant Medical College & J.J. Hospital, Mumbai, Consultant Surgeon and Head, Department of Minimal Access Surgery, P.D. Hinduja Hospital & Research Centre, Consultant Surgeon at B.D. Petit Parsee General Hospital, Breach Candy Hospital & Research Centre, Mumbai.

Professor Tehemton Erach Udwadia is an alumni of St. Mary’s High School, Wilson College, and Seth G.S. Medical College, Bombay, graduating from the University of Bombay in 1956 and did his post-graduation from the University of Bombay and the Royal Colleges of Surgeons of England and Edinburgh. Joined the Surgical Staff of the Grant Medical College & J.J. Hospital, Mumbai in 1963. He retired as Honorary Professor of Surgery in 1994 and is now Emeritus Professor of Surgery, Grant Medical College & J.J. Hospital, Mumbai. He was Consultant in Surgery to the Armed Forces and Chairman Indian Chapter, Royal College of Surgeons Edinburgh. He has been elected President of several National and International Surgical Societies such as the Indian Association of Gastrointestinal Endo-Surgeons (Founder President), Society of Gastrointestinal Endoscopy of India, the Association of Surgeons of India, International College of Surgeons World Body, Society of Endoscopic and Laparoscopic Surgeons of Asia and President of the International Federation of Societies of Endoscopic Surgeons (IFSES). He has been honoured with the Padma Shri National Award from the President of India. He has been honoured with the Order of the British Empire.
(OBE) by Her Majesty Queen Elizabeth II.

His efforts were recognized by several awards bestowed on him. To name a few, Dr. B.C. Roy National Award for promoting the Speciality of Laparoscopic Surgery in India from the President of India, Hunterian Professorship of the Royal College of Surgeons of England, Surgikos Lecture of the Association of the Surgeons of Great Britain and Ireland, Pandalai Oration of the Association of Surgeons of India, Sir Sriram Oration of the National Academy of Medical Sciences, Sir James Ross Lecture of the Royal College of Surgeons of Edinburgh, Ganga Ram Oration, the Dr. Karl Storz award of the Society of American Gastrointestinal Endoscopic Surgeons, the Lifetime Achievement Award of the Indian Association of Gastrointestinal Endo Surgeons and a Gold Medal and citation from Dr. Abdul Kalam, President of India.

A forceful, innovative and renowned teacher and surgeon, he was the first surgeon in India to start laparoscopy in surgery in 1972, and the first to perform laparoscopic surgery in the developing world in early 1990. With missionary zeal Professor Udwadia has conducted workshops all over India and in Nepal, Mexico, Brazil, China, Myanmar, Bangla Desh, and other developing countries spreading the gospel of laparoscopic and Minimal Access Surgery. He has put all his efforts into realizing his belief that the benefits of surgical advance should be made available to all people, in all places, irrespective of their socio-economic status. His innumerable research papers and presentations over forty years cover a wide field of surgery - from myocardial revascularisation (his PhD topic) to research in abdominal tuberculosis, ascites, hydrocephalus, peritonitis, flexible endoscopy and diagnostic
and therapeutic laparoscopy.

Along with over 30 professional affiliations he has been conferred Honorary Membership of the Japan Section of the International college of Surgeons, Indian Association of Gynaecological Endoscopy, College of Surgeons of Brazil, Nepal College of Surgeons, the International College of Surgeons, German Society of Visceral (Abdominal) Surgery, the Association of Rural Surgeons of India. Examiner in Surgery to several Universities in India and abroad, the National Board of Examination and the Royal College of Surgeons, Past Chairman / Editor Indian Journal of Surgery, and the Editorial Board of several National and International Journals (British Journal of Surgery, International Surgery, HPB Surgery, National Medical Journal of India etc.) Professor Tehemton E. Udwadia is the author of two landmark books on Laparoscopic Surgery - “Laparoscopic Cholecystectomy” (1991), and “Laparoscopic Surgery in Developing Countries” (1997) and contributing author to 22 books on surgery. He is the Editor-in-Chief, the Journal of Minimal Access Surgery.

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