Vitus Spine

VITUS SPINE NEWS

Quarterly Newsletter updates
(Formerly JISAR Newsletter)

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From the Editor's desk

Dear Friends,

Happy New Year ! Hope this New Year brings in the best that life can offer to you and your family. Excellence in the spheres of our activity inspires all of us to deliver the best of care to our patients. This pursuit of excellence is always looked upon as a daunting endeavor as we are conditioned to think of excellence as a "tough nut to crack". In this issue we hope to provide food for your thought on how excellence as a concept is objectively achievable in various spheres of medicine.

Happy Reading...

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That's one small step for man, one giant leap for mankind. - Neil Armstrong

It was a journey that mankind had never taken before... Behind the men who were celebrated for their effort were the many scientists, engineers, and managers with the brainpower to make it all possible. "It was something where there were no rules and nothing from the past to go by".
It was the excellence of few people that made this historic leap possible...one of them was Margaret Hamilton. Hamilton, a computer engineer, wrote the code for Apollo 11's on-board flight, which turned out to be one of the most important aspects of the mission, ensuring the safe return of Apollo 11. She described her code work as "software" and is credited with coining the term "software engineering".
On November 22, 2016, President Barack Obama awarded Hamilton the Presidential Medal of Freedom for her contribution that led to Apollo 11's successful landing.

Figure 1: Margaret Hamilton stands next to a stack of Apollo Guidance Computer source code. Her "software" was all hardcopy! Credits: Courtesy MIT Museum

Medical science is a field where the journey into the unknown is more often a rule than an exception. Many discoveries and innovations have their origin in the zeal and persistence of few pioneers, who chose to see beyond the known. History of medicine is replete with such innovative work...

- *Be it the discovery of antibiotics with pioneering work by Alexander Fleming in 1928 , which stopped the certain demise of humans to innumerable microbial infections,*
- *or the meticulous and painstaking innovative research that led to creation of long lasting artificial human joint by Sir John Charnley, immensely improving the quality of life of generations of people suffering from joint disorders,*
- *Or the discovery and evolution of anesthesia from John snow's ether to the present day anesthesia, which has radically minimized pain and suffering for the patients.*

These, and many more instances of human excellence, have inspired generations, and ***have brought credibility, authenticity, belief and reverence to the field of modern medicine.***

- *Does excellence have to benefit a large scale of people to inspire?*
- *Are we not witness to our own acts of excellence making our patients healthy and happy? Some are unforgettable and are so inspiring that they bring our passion of being a doctor, right back.*

We share a few such instances in our practice which have always inspired us and kept our enthusiasm to try and achieve excellence in our everyday work.

Case 1:

He was a 31 year old male with progressively increasing dorsolumbar Kyphoscoliosis since 20 years. He came to us with about 160-180 degree kyphoscoliosis and pulmonary compromise with dyspnea on minimal walking. Once the spinal curvature crosses 100 deg, the secondary pressure effects on the otherwise normal pulmonary function begins to set in. Here the pressure effects had resulted in a significant decline in his pulmonary function and had become a life threatening condition as it led to dyspnoea at rest with secondary cor pulmonale. The patient was refused surgery at many spine centers as the risk of paraplegia and postoperative pulmonary compromise and risk for life was very high.

Figure 2: Preoperative clinical photograph and radiograph showing the severe 180 degree spinal deformity. Note the restricted space available for the lungs

The patient asked us if he will survive without the spinal deformity correction. The pulmonologist opined that there was little hope of reversal of his pulmonary condition without increasing the space available for his lungs. Consequently, the patient and relatives were clearly explained the risk involved in surgical correction of his deformity including that of paraplegia and risk to life due to poor pulmonary condition. He was advised home oxygen for 1 week prior to surgery with medications to optimize his pulmonary condition.

Surgical procedure: *The patient was prepared for spinal deformity correction by posterior pedicle screw-rod instrumentation with support from the pulmonology and anaesthesia team. The surgery took about 6 and ½ hrs with a blood loss of approximately 2.2 liters. Midway during the surgery, the patient had transient hypotension as there was continuous blood loss at the spinal osteotomy site. The spinal column was resected of all the bony structures (Known as vertebral column resection or VCR) at the apex of the curve except for the spinal cord in order to correct the spinal deformity.*

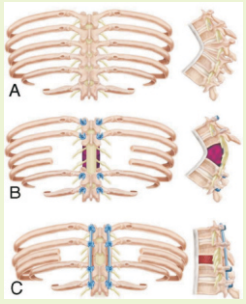


Fig 3: Vertebral column resection involves resection of all the bony elements around the apex of the spinal deformity, except the spinal cord (A,B) and then correcting the deformity with gradual manipulation of the spinal column with screws and rods (C).

We had initially planned for two such osteotomies to correct the severe 180 deg curvature, however as our anaesthetist was not in favor of further blood loss, we restricted to a single level VCR with partial correction of the curve. Introperative real time monitoring of the spinal cord function was done with NIM eclipse IONM machine (Medtronic. Inc.). The patient was kept in ICU for 24 hrs for monitoring and he was able to walk after 72 hrs after surgery.

Figure 4: Pre and postoperative clinical photographs and radiographs showing the partial correction of the spinal deformity. Note the increase in the space available for the lungs and the increase in the truncal height clinically.

It was one of the most gratifying surgeries we have been able to perform successfully as a team. Today, 4 years after the surgery the patient is walking without dyspnoea and doing all his daily activities. The postoperative radiograph shows the increase in the space available for the lungs despite a moderate correction of the spinal curvature. The clinical photographs show the increase in his truncal height with the angular correction of the spinal column.

Case 2:

She was a 23 year old girl with a significant hump in the back due to tubercular infection affecting her spine when she was a child. Healed tuberculosis of the spine with severe kyphosis is one of the nightmares for a spine surgeon. The risk of neurological worsening with the hypervascularity of the scared tissues and bones makes this a challenging surgery. The girl had a kyphosis of about 136 degrees but fortunately did not have any neurological deficit yet. She was counseled about the risks involved in the surgery including neurological deficits and risk for life.

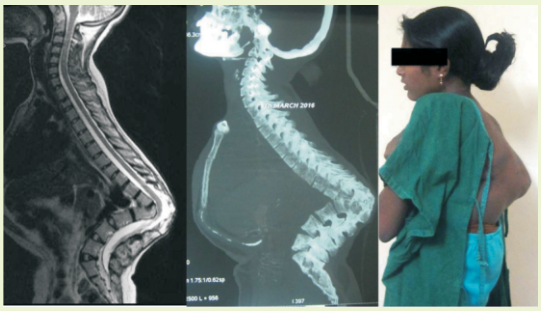
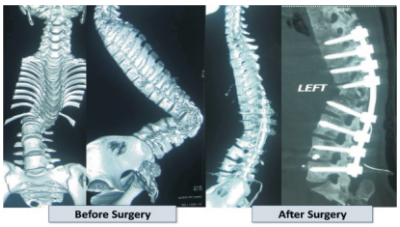


Figure 5: Post-tubercular kyphosis of the spine with significant clinical hump and traction on the spinal cord

Surgical procedure: *We planned a posterior vertebral column resection (VCR) osteotomy of the spine with deformity correction. VCR is a type of spinal osteotomy where one or more vertebrae are removed at the apex of the deformity with only the spinal cord hanging between the above and below vertebral columns. The deformity is then corrected with careful angular manipulation of the spinal columns around the spinal cord, taking care not to transmit any traction or undue deformation to the spinal cord. The availability of* ***intraoperative neuromonitoring*** *is of great help in such deformity corrections. We could perform the surgery without any major hiccups and with the confidence provided by normal signals from neuromonitoring we could achieve a significant correction of her deformity.*

Figure 6: Pre and postoperative clinical photographs showing the significant correction of the spinal deformity. Note the increase in the truncal height postoperatively.

Figure 7: Pre and postoperative CT scans showing the deformity correction achieved with VCR and posterior spinal instrumentation.



The patient and relatives were astonished by the amount of correction of her hump after the surgery, as we had counseled that a partial correction only will be possible. The postoperative and follow-up photographs show the increase in truncal height and the good cosmetic correction of the hump achieved.

Can we achieve excellence in our everyday practice?

- *Is it necessary that we have to do something great to achieve excellence?*
- *Is it possible to achieve excellence even in the routine and simple work we do every day?*

Do we not experience the joy of working some days?, Even after a full day's work, we still feel fresh at the end...what makes us have so much energy on certain days?

We all would have observed a state of flow that comes when we are doing a routine work, say for example, like a morning jog...at times it feels so joyous to feel the rhythmic way one step follows the other, without our conscious effort...it is almost like we have to make an effort to actually stop running...is it not the state of flow that people talk about?...can we call it excellence in jogging?

Lot of work has been done to assess the ingredients required to achieve excellence at our work. One of the most popular works on achieving excellence was published by Karl Anders Ericsson (1996). His celebrated work showed that the most important way to achieve excellent performance in fields such as sport, music, professions and scholarships is to practice.

- *Achievement of excellence in such fields commonly requires approximately 10 years of dedication, comprising about 10,000 hours of effort.*

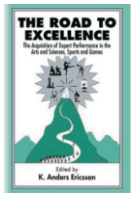


Figure 8: The road to excellence: the acquisition of expert performance in the arts and sciences, sports, and games. Karl Anders Ericsson (1996), Lawrence Erlbaum Associates, 01-Jun-1996 - Psychology.

This is a well researched paradox of life which says that you need years of effort to become effortless at the work you do.

- *"An ounce of practice is worth more than tons of preaching."– Mahatma Gandhi*
- *As Sachin Tendulkar once remarked on his amazing innings against Pakistan in the 2003 Worldcup – "the effortless six I hit was the result of years of practice"…*

This has also been substantiated by studies showing consistent and superior results achieved in surgical centers having higher volumes and following a strict and uniform surgical practice.

The Shouldice Hospital for hernia repair is a classic example showing how excellence matters even in a simple surgical procedure like hernia repair. Experts' still debate on the technique for hernia repair followed at the centre. However, the consistent results and the uniform surgical technique followed by all the surgeons, from the novice resident to the senior most surgeons at the institute, stand testimony to the fact that "practice makes a man perfect".

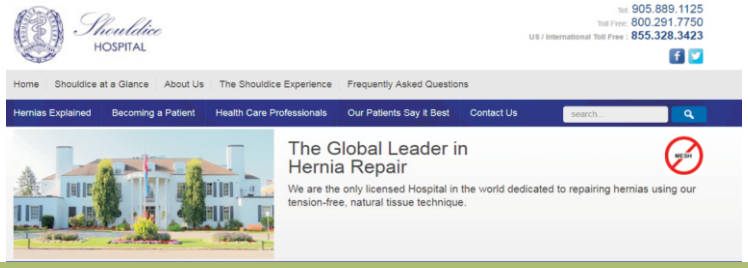
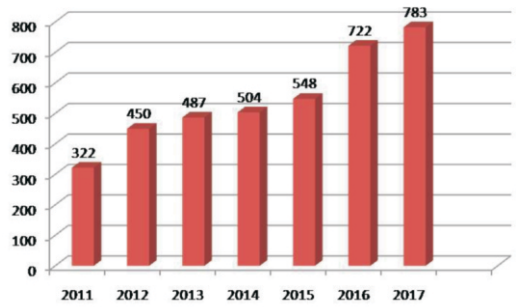


Figure 9: Founded in 1945, Shouldice Hospital is the global leader in hernia repair.

Their 99.5% lifetime success rate for primary inguinal hernias sets the gold standard for medical professionals around the world.
"Over 7000 hernia repairs are done every year which results in a level of experience and expertise unequalled throughout the world". Their rate of infection, complications and recurrence is less than 0.5% for primary inguinal hernia repairs. This is the lowest recorded rate in the world.
We, at Vitus spine have been following a uniform surgical practice, right from the criteria for selection of surgical procedure, the intraoperative techniques of decompression/ spinal instrumentation to the protocol of postoperative care from our residents to our consultants. Although our process may not be the only way to practice spine surgery, over a period of years we have been successful in providing good results to patients with our consistency in sticking to a set pattern. The excellence we can achieve with repeated practice into our everyday surgical practice and the outcomes were eye-opening for ourselves. Our own records (We maintain our surgical logbooks meticulously with all patient details and the surgical details) show the improvement in the surgical time we have been able to achieve, for example, in a simple single level lumbar fusion (transforaminal lumbar interbody fusion- TLIF) over a period of seven years since we started our centre.



We used to take an approximate 150 to 180 minutes for single level TLIF 7 years ago and now it takes anywhere between 60-90 minutes, with any of our team members operating. This has resulted in lesser blood loss and faster recovery of the patients and all patients with simple fusions are made to walk the evening of surgery. Since the inception of our centre, we have performed 3,816 spine surgeries as a team till date (Figure 10). Our infection rates are less than 1%, below the average of 1-2%, set as standard by world bodies[1]. (SRS morbidity data[1] - total infection rate of 2.1%)

Figure 10: Shows the total number of spine surgeries performed by our group, every year, since 2011.

The change is even more perceptible in complex cases like deformity correction, where every member of our surgical team understands what is expected at any time during the procedure. All of us know the set patterns and steps of the procedure and so can deal with any variations or surprises more efficiently. As with the simple surgical procedures, the rigorous pattern followed in these complex procedures has enabled us to apply the Karl Ericsson concept of achieving excellence through repetition and practice.

Adversity and opportunity:

It is true that human beings come out with exceptional thinking and work, when pushed against a wall, as if the inner excellence needs a push to come out in the open!!. Take for example the ingenious ways a few ordinary German citizens crossed the great Berlin wall against all odds or the innumerable innovations in the treatment of injuries, which are often traced to the desperate times of the world wars.

One of our own technical discoveries came in a desperate situation during surgery on cervical spine.
Case 3: The patient was an elderly man who had sustained a fall with quadriparesis a week ago. His imaging showed long standing cervical stenosis from C3 to C6 with myelomalacia changes along with cervical kyphosis. He required decompression of his cervical cord along with correction of kyphosis. We had planned for a Laminectomy decompression at 4 levels with cervical pedicle screw instrumentation to correct the cervical kyphosis. However, midway alone the procedure we noticed that his pedicles were sclerotic with degenerative bone formation. This made it impossible for us to negotiate the owl or the pedicle probes into the pedicle which was essential to insert a pedicle screw. The only option left was to attempt kyphosis correction from an anterior approach at a second stage if we cannot insert lateral mass or pedicle screws. As our orthopaedic training had taught us that the only way to insert a screw in a sclerotic area was to use a drill, we decided to use a high speed drill to make a pilot hole into the cervical pedicle. The only problem in using the drill in this area was that the cervical pedicle lies in between the spinal cord medially and the vertebral artery laterally and any error in the direction of the drill can be catastrophic (Fig 11) .

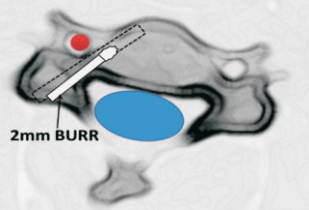


Figure 11: Axial section of the cervical vertebra showing the path of drilling going inbetween the spinal cord medially and the vertebral artery laterally.

However with our experience of inserting cervical pedicle screws using the pedicle owle, we could successfully insert the screws in the cervical pedicle after using the high speed drill. The patient did well and a second surgery was avoided with this new technique.

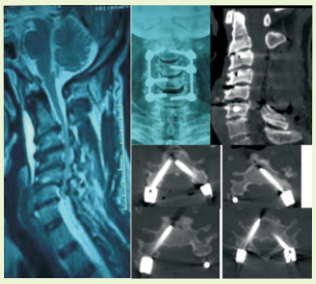


Figure 12: Preoperative MRI showing C3 to C6 compressive myelopathy and Kyphosis. Postoperative images on the right showing decompressive Laminectomy with kyphosis correction using cervical pedicle screws.

Since this technique was not used anywhere in the world, we reported our experience of using this technique with lesser lateral perforations, with a long follow up of 3 to 5 years in one of the leading international journal of spine[2-4]. Today ***we have the largest series of cervical pedicle screws*** *in the country and this has genuinely benefitted a number of our patients having cervical disorders.*

Excellence can inspire:

Medical field today is also facing some desperate times. We need some inspiration to look forward to our everyday work, amidst all the negativity. What better inspiration can we get than achieving glimpses of excellence in our everyday work? A single patient, who gets better with our timely thinking or an ingenious modification, bringing about an excellent result, makes our day. Is this not the inspiration that we look for?

- *Apart from excellence in scientific practice, the situation today is also calling for excellence in our moral practice.*
- *Is sticking to excellence a very high price to pay? Answer the initial question.*
- *Probably excellence in our work is the only way to bring back the lost* ***credibility and reverence to our practice.***
- *Who can know better than us the joy of working in an environment with faith and credibility? An approach with perseverance to achieve excellence in our scientific as well as moral practices shall not only inspire us but also the society at large.*

Let us dream of excellence and inspire ourselves.

And, yes, at Vitus Spine we still dream of excellence!

HAPPY NEW YEAR!!

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Vitus Spine Also Available At ..

Excellence is health care is more often than not associated with a notion that it exists only in the big cities in hospitals with state of the art infrastructure. This makes patients travel to these cities in search of the best possible solutions to their diseases. Even in spine surgery, there is a misconception among the public that the journey to a city or cosmopolitan center is imperative to achieve an excellent outcome for all disorders.

Majority of the therapies offered in spine are for degenerative disc conditions, trauma and infection. The non-surgical options include selective nerve root blocks, facet injections and trigger point infiltrations while the surgical options range from simple decompression to instrumentation and fusion along with biopsy whenever required. All these treatment modalities can be executed in centres in the district headquarters or tier 2 cities in set ups which support basic surgical and clinical care.

We have always believed in the concept of taking tertiary spine care to these towns in order to not only make it easier to the patients but also make spine care a more acceptable and safe proposition.

In this effort we have started the department of spine surgery at two hospitals, one in Tumkur and Hosur each.

Tumkur: Siddaganga Hospital & Research Centre

We have started the department of spine surgery and provide spine services on a continuous basis with our team visiting the hospital every day.

Hosur: SBS Hospital

We have been running spine services in Hosur with weekly visits since early part of 2017.

The following services are available at Hosur and Tumkur.

OPD:
- Consultation by qualified spine surgeon
- Back care education
- Pain management
- Physiotherapy
- Postural training

OUTPATIENT PROCEDURES
- Facet Joint Injections
- Nerve Root Injection
- Sacroiliac Joint Injection
- Trigger Point injections
- Dry needling

SURGERIES
- Micro discectomy
- Spinal Instrumentations and fusions
- Cervical discectomy and fusions
- Cervical pedicle screw instrumentation, laminectomy , laminoplasty
- Deformity(Scoliosis/Kyphosis) correction
- Occipito-cervical fusions

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