Radical prostatectomy has undergone an evolution over the last 25 years. An accurate, nerve sparing, anatomic approach in the ‘90s resulted in a significant improvement in outcomes with regard to cancer control, continence, and erectile function. The morbidity of Open Retropubic Radical Prostatectomy (ORP) was reduced somewhat by the introduction of Laparoscopic Radical Prostatectomy (LRP) in the last 15 years but the uptake of this surgery has been fairly limited due to the high degree of difficulty and the long learning curve. Laparoscopic prostatectomy was not an easy operation due to the loss of freedom of motion, the counter-intuitive movements of instruments intra-abdominally and the lack of depth perception due to the single lens. With the introduction of the da Vinci Robot in 2000 the advent of Robot Assisted Laparoscopic Radical Prostatectomy (RALP) has led to a groundshift in the surgical treatment of prostate cancer. The technology has enabled many more surgeons to take up laparoscopic radical prostatectomy without the obstacles associated with standard LRP. Last year in the USA 85% of all prostatectomies were RALP.

The da Vinci Surgical System (Intuitive Surgical, Sunnyvale Ca.USA) is somewhat misnamed as a robot. It is, more accurately, a computerised surgical interface. But the name “robot” has stuck. It involves 3 main elements - a bedside component with 4 mechanical arms to control the working elements and cameras, a High Definition 3D visual system, and a working console for the surgeon with vision, joystick-like controls for the surgical instruments, as well as controls for adjusting the camera position and electrocautery. This offers improved ergonomics for the surgeon, as well as other features such as scaling control of movements and eradication of tremor. The 3D vision offers an exceptional view of the operative field with ample magnification.

The surgical instruments of the robot move at the tips and copy the hand movements of the surgeon, in miniature, with 7 degrees of freedom (compared to 4 for standard laparoscopy).

All this allows for excellent movement and 3D vision in confined spaces giving increased dexterity for facile dissection and suturing. It enables all the benefits of laparoscopic surgery – small wounds, decreased blood loss and rapid convalescence. It allows surgeons to do things laparoscopically that are more precise and secure than ever before. It puts laparoscopic surgery safely and rapidly within the reach of more surgeons.

Operative applications are expanding from radical prostatectomy to include partial nephrectomy, gynaecology and procedures in many other specialties.

There are some downsides to robotic surgery. Compared to open and standard laparoscopic surgery, there is a loss of haptic feedback because of the machinery. Nevertheless, using visual cues there is a certain development of “feel” over time. Mechanical failure is rare, but it is important to be aware of the strength of the mechanical arms and the great care that needs to be taken to avoid inadvertent damage to intra-abdominal structures.

There are significant costs associated with robotic surgery – both in the initial setup outlay and in the ongoing service, disposables, and instrument costs.
Pain derived from spinal conditions (low back pain, sciatica, neurogenic claudication, neck pain, brachalgia) remains one of the most common clinical problems affecting our population. 80% of people experience an episode of low back pain at least once in their lifetime. By far the most common causes of spinal derived pain are mild trauma (causing disc lesions) and degenerative spondylosis. The vast majority of these presentations are treated successfully by conservative measures including initial rest, appropriate analgesia, directed muscle strengthening programmes, and lifestyle changes including weight loss and regular exercise. Failure to improve following these measures will usually lead to further investigations such as plain radiographs, CT scanning or MRI of the affected spinal region. The information from these images may help in directing CT-guided steroid injections as a further treatment option.

Ultimately, patients who continue to have debilitating symptoms may end up considering surgical treatment to help control or relieve their pain. These surgeries involve decompression of neural elements alone or decompression combined with fusion of spinal motion segments. Major advances in spinal surgical techniques now make these operations far less uncomfortable with reduced peri-operative pain, shorter hospital stays and a faster return to work. The improvements in instrumentation and implants now enable most spinal operations, including multilevel fusions, to be performed through very small incisions (1-4 cm). This minimises and even eradicates muscle dissection leading to significant reductions in surgical blood loss, post-operative pain and the need for inpatient rehabilitation. Most patients can mobilise the same day of their surgery, with all patients mobilising post-operative day one. The small “keyhole” incisions also mean older patients and those previously considered medically unfit for surgery can benefit from these techniques. Patients on anti-platelet therapy generally do not need to cease these medications. Improvements in “artificial bone grafts” have also removed the need to harvest autologous iliac crest bone graft, previously a major source of post-operative morbidity.

ANTERIOR LUMBAR INTERBODY FUSION
ALIF is a longstanding technique used to fuse spinal segments, but its use was limited by the need to turn the patient over and augment the construct with posterior screws. Newer implants now enable “stand alone” ALIFs with plates and screws inserted anteriorly (Photo 1). This allows single level fusions to be performed through a 3cm abdominal incision with no muscle dissection at all. Muscle preservation negates the need to wear an uncomfortable brace post-operatively and allows patients to return to normal activities within days. This technique allows complete removal of bulging/herniated discs, removal of marginal osteophytes, and offers excellent cranio-caudal decompression of nerve roots in the intervertebral foramina. It can be used to decompress and fuse the L3/4, L4/5 and L5/S1 levels (Photo 2). Contra-indications to using this approach include morbid obesity,
excessive abdominal scarring, significant calcification of the great vessels, and osteoporosis. Surgery at L5/S1 carries a small risk of retrograde ejaculation in males and therefore men still wishing to have children are usually advised to consider other approaches to this level.

DIRECT LATERAL INTERBODY FUSION

DliF (also known as XliF) is a new technique which allows minimally invasive access to the thoracic and lumbar spine through incisions in the lateral abdominal wall. A muscle splitting approach gains entry to the retroperitoneal space and muscle dilating retractors expose the intervertebral disc through the psoas. Free running and triggered nerve conduction monitoring helps avoid injury to the lumbosacral plexus. Two levels can be approached per 3 cm incision, although L5/S1 can’t be accessed due to the iliac crest obstructing the way. After discectomy is performed an interbody cage containing artificial bone graft (Photo 3) is inserted to realign the spine and open the spinal canal and foramena. This approach is commonly used on older patients with degenerative scoliosis. Previously, these patients would require extensive posterior surgeries with extended rehabilitation to achieve symptomatic improvement, however, similar results are now achievable through two small incisions with 3 or 4 levels fused across the apex of the scoliotic curve (Photo 4) and patients are generally discharged home in 3-4 days.

PERCUTANEOUS PEDICLE SCREWS

Insertion of pedicle screws to augment posterior fusion surgeries use to require extensive muscle dissection over the facet joints to gain access to the screw entry points. Unfortunately, this would divide the neurovascular bundle and cause ischaemic atrophy of the paravertebral muscles, a process which is believed to contribute to failed back surgery syndrome. Spinal surgery has been revolutionised by the development of instrumentation which allows percutaneous insertion of pedicle screws and rods through small “stab” incisions in the skin. Muscle dissection is minimal. The technique involves cannulation of the pedicle with a K wire over which the screw is guided into position (Photo 5). Image guidance systems utilising intra-operative CT make the surgery extremely accurate and shorten operation times significantly (Photo 6).

References available on request.
THE ANTERIOR APPROACH IS A STEP FORWARD IN HIP ARTHROPLASTY

Dr Munjed Al Muderis

DEFINITION

Hip joint arthroplasty is a surgery to replace the articular part of the hip joint with an artificial joint. The aim is to take the pain away, restore function and preserve anatomy.

HISTORY

Over the last three centuries, treatment of hip arthritis has evolved from rudimentary surgery to modern total hip arthroplasty (THA), which is considered one of the most successful surgical interventions ever developed.

The anterior approach to hip arthroplasty is not new. Judet first introduced it in France in 1947 and many surgeons have been using this approach worldwide successfully for decades. What is new about the anterior approach is that the surgery is being done through a smaller incision with minimal dissection to the soft tissue using special instruments and a special table to make the surgery less traumatic to the patient allowing faster recovery.

THEORETICAL ADVANTAGES OF THE ANTERIOR APPROACH

As the posterior structures are maintained when performing the anterior approach, this reduces the chance of post-operative dislocation.

The anterior approach to hip replacement is a true minimal invasive technique as no muscles are being detached or resected. This reduces the amount of trauma to the muscles involved, which are essential for daily hip activities.

The important muscles used in hip function are not damaged when using the anterior approach. The result of this reduced trauma means that patients can return to normal daily activities quickly. A big advantage of the anterior approach is that it is better than other approaches. The best approach is the approach that allows proper positioning of the implant replacing the native hip joint with minimal soft tissue dissection.

Proper training is extremely important to reduce complications and ensure good outcomes.

ANATOMICAL CONSIDERATION

The human joints are defined as being articulation between two or more bone endings. The hip joint is made by articulation between the acetabulum of the pelvis and the femoral head forming a ball and socket type articulation. A layer of smooth soft cushion of articular cartilage covers these bone endings, which provide excellent shock absorption and smooth surface facilitating the movement. With age this layer of cartilage wears off and this leads to the development of arthritis resulting in pain, stiffness and deformity.

The hip joint anatomically lies closer to the anterior surface of the body than the back, furthermore, the anterior muscles around the hip are aligned in a longitudinal direction in line with any planned surgical incision while muscles behind the hip lies in a horizontal direction. Any incision posteriorly to access the hip has to cut these muscles to get to the joint. What is unique about the anterior approach to the hip is that it is a muscle splitting approach where the incision is made between two muscles, the Sartorius and Tensor Facia Lata (TFl) in order to get to the hip joint so no muscle is cut during this surgery. It is also an intraneurous approach so no nerves are severed during the approach due to the fact that these two muscles are supplied by two different nerves. The Sartorius is supplied by the femoral nerve while the TFl is supplied by the Superior Gluteal nerve so no nerves are crossing the incision line or at risk. All the other approaches to the hip involve either muscle cut; bone resection or the incision is traversing motor nerve fibres supplying important muscles in the region.

IS THE ANTERIOR APPROACH BETTER?

The outcome of THA depends on many factors: the patient, the implant, the surgical technique and the approach. The patient factor involves the cause and the severity of arthritis, bone quality, presence of other co-morbidities, which may adversely affect healing.

The implant factor involves the type of prosthesis such as cemented or cementless implants, the articulating surface such as ceramic, metal or plastic. Accurately selecting the type of implant and the articular surface according to the patient is very important to get the best outcome.

The surgical technique and approach are very important in determining the outcome of surgery. The anterior approach was developed to try to address some of the common complications that are associated with other approaches to the hip such as dislocation, leg length discrepancy, abductor dysfunction and to allow early recovery and faster rehabilitation, however, one cannot say that the anterior approach is better than other approaches. The best approach is the approach that allows proper positioning of the implant replacing the native hip joint with minimal soft tissue dissection.

The anterior approach has many features which makes it a very important approach to use in total hip replacement surgery.

- The important muscles used in hip function are not damaged when using the anterior approach. The result of this reduced trauma means that patients can return to normal daily activities quickly.
- A big advantage of the anterior approach is that there are little restrictions post-operatively. Post-operative restrictions associated with the posterior approach, such as not sitting down in a low chair or not bending down to tie your shoelaces, are not needed as the posterior structures are not damaged using the anterior approach.

- Proper training is extremely important to reduce complications and ensure good outcomes.

- The outcome of THA depends on many factors: the patient, the implant, the surgical technique and the approach. The patient factor involves the cause and the severity of arthritis, bone quality, presence of other co-morbidities, which may adversely affect healing.

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- The anterior approach has many features which makes it a very important approach to use in total hip replacement surgery.
This new surgical approach involves traversing the psoas muscle to reach the anterior aspect of the vertebral column. The surgery is performed with the patient on their side and a small incision, three to four centimetres, in the flank. It is a form of the new minimal approach spinal operations that avoid dissecting the posterior muscles from the spine. There is no dissection in the spinal canal disturbing the nerve roots and cauda equina and importantly the epidural venous plexus is not traversed and the approach is essentially bloodless. The approach utilises x-ray guidance and an illuminated tunnel. The surgical path is between the aorta and inferior vena cava anteriorly and the spinal canal and cord or cauda equina posteriorly.

The surgical approach was first presented by a Brazilian surgeon Luis Pimenta at a conference in 2001. It was developed following lumbar plexus traction injuries sustained when attempts were made to access the lumbar interbody space from an anterolateral approach elevating the psoas. The approach enters the retroperitoneal space through the three layers of the abdominal wall, with blunt dissection through the external oblique, the internal oblique and then popping through the transversalis fascia. With the patient on their side, the bowel and kidney fall forward out of the surgical path. The fingers slide down the posterior wall to reach the transverse process and the psoas muscle and ensure there is no bowel in the way.

The lumbar plexus is protected by the use of neural monitoring during the passage through psoas. A thin blunt rod with monitoring leads attached is introduced with a twisting motion through psoas while tracking the intensity required to stimulate a nerve recorded through needle electrodes inserted in the muscles of the lower limbs. A low intensity indicates close proximity to a nerve and the rod is removed and a new passage is sought.

Having safely reached the lateral aspect of the disc, the psoas is spread and held apart by a retractor while first the annulus and then the remaining degenerate nucleus is removed. Curettes remove the cartilaginous endplate to bleeding bone which will accept the bone graft or substitute and allow fusion in the same manner as a uniting fracture. The bone graft is contained in a spacer/cage which maintains usual intervertebral disc height and angle while fusion occurs. Carbon-fibre and polyether ether ketone PEEK plastic cages are used. These are not as hard against bone as previously used titanium and do not tend to subside into bone.

The spacer/cage distracts the vertebral bodies, recreating the usual disc height and opening the stenosed foramina and canal to indirectly relieve the degenerative stenosis producing neurogenic claudication and radiculitis. I have demonstrated this resolution using intra-operative myelograms. Once the cage and graft is in place, the fascia is repaired and the skin closed. The patient is then turned prone and percutaneous screws are inserted over guide wires again utilising imaging guidance to avoid dissection of the spinal muscles.

The advantage of this approach is the minimal blood loss as the epidural venous plexus is not penetrated, the large cage/spacer containing bone graft in the anterior interbody space where 80% of spinal load is taken, avoidance of dissection around and traction to the cauda equina and nerve roots, lack of mobilisation of the great vessels, minimal muscle dissection with decreased post-operative pain.

The patient is mobilised four hours post-operatively on the Orthopaedic Ward. The following day the patient can enter the hydrotherapy pool and at 48 hours post-operatively can go home with a daily home-based physiotherapy programme or be transferred to a Rehabilitation Hospital for further care.
Around 180,000 Australians are currently living with Alzheimer’s disease (AD) and the prevalence is expected to triple over the next 40 years. It has no cure or effective disease modifying therapy and our current symptomatic treatments are only modestly effective in some. In recent months, several high profile anti-amyloid drugs in phase 3 trials (Bapineuzumab and Solanezumab) have failed. What’s new in the field?

**AD: MORE THAN MEMORY**

AD usually starts in the medial temporal lobes causing short-term memory loss as the first sign of incipient cognitive decline. We now however recognise three distinct variants of AD, affecting language, visual processing and behaviour respectively. In Logopenic or language-variant AD, affected individuals present with slowing of speech, loss of fluency and word finding difficulty. Visual variant AD, also called Posterior Cortical Atrophy, presents with progressive visual difficulties such as distortion of images and colours, difficulty reading and judging distances. Frontal variant AD presents with personality and behavioural changes such as loss of manners and empathy, social disinhibition, apathy, change in food preference and neglect of personal hygiene. These less common presentations of AD need recognition, and differentiation from other neurodegenerative, neurologic and psychiatric disease. AD is more than just a memory disorder!

**PRECLINICAL AD**

Till recently we’ve considered AD as having 2 phases. In Mild Cognitive Impairment (MCI), patients and their families notice cognitive changes that do not interfere with daily functioning, and on clinical testing objective memory deficits are observed with otherwise preserved cognition. Later, Alzheimer’s disease dementia is characterised by progression of cognitive deficits outside the memory domain and difficulties with daily functioning.

Studies of the rare inherited forms of AD show that the Alzheimer disease process starts in the brain between 10-25 years prior to clinical presentation, as early as the 40s in individuals destined to develop AD. Like atherosclerosis prior to symptomatic heart disease or carcinoma-in-situ, there is a long preclinical period prior to a relatively shorter phase of clinical decline. This reflects cellular changes in the brain, with deposition of the proteins beta-amyloid and tau in and around neurons, and neuronal death measured over decades, with around 50% of neurons destined to die in AD lost by clinical presentation. This very long Preclinical phase of AD thus represents a huge opportunity to intervene in the disease years before symptoms appear. The recent failures of disease modifying drugs likely occurred because we are intervening much too late in the disease cascade. Current work is focusing on identifying clinically useful biomarkers of the disease, so we can identify individuals in their Preclinical phase, and measure the effectiveness of our interventions in these early stages, years before cognition is impaired.

**AD BIOMARKERS**

Worldwide, five biomarkers change in a predictable sequence prior to the onset of AD and are in use in clinical trials and to a lesser degree, in clinical practice.

**AD Biomarkers**

1. CSF beta-amyloid level (±)
2. Amyloid (PiB) PET
3. Fluorodeoxy-glucose (FDG) PET
4. CSF tau (±)
5. Volumetric MRI
Though several of these biomarkers remain at present only research tools, dedicated FDG-PET scanning is becoming a clinically very useful tool in making the diagnosis, especially very early on, where patients present young, or with one of the less common variants of AD.

AD RISK FACTORS

Age and genetic inheritance are important but not modifiable; however traditional vascular risk factors are directly relevant to lifetime risk of AD and the risk factors below are together responsible for up to 50% of AD. Hypertension and obesity seem important only in midlife and may even be protective in the elderly, and physical inactivity is probably the single most important risk factor in the Western World. Current recommendations are: between age 40-60 keep BP, blood sugar level and BMI within normal limits and treat depression. Don’t smoke, eat well (ideally the Mediterranean diet) and do 20-30 minutes of aerobic exercise most days of the week. Walking is not enough!

**Modifiable Risk Factors for AD**

1. Diabetes
2. Hypertension
3. Smoking
4. Poor diet (high in saturated fat; low in vegetables)
5. Obesity
6. Physical inactivity
7. Cognitive inactivity/low educational attainment
8. Depression

*most important modifiable risk factors in the Australian population*

**TREATMENT IN 2012**

In Australia we have three cholinesterase inhibitors (Aricept, Exelon and Reminyl) and one glutamate antagonist (Ebixa). The cholinesterase inhibitors are useful for cognitive and behavioural symptoms of AD throughout the disease course; Ebixa is useful in the latter half of the clinical illness. Together these medications are of modest effectiveness, and some patients don’t respond at all, but in Australia many people who might benefit from treatment are never prescribed it. Gastrointestinal side effects can limit treatment, and patients should have a pretreatment ECG as cholinesterase inhibitors can slow cardiac conduction. However, patients and their carers appreciate even modest improvement in cognition and daily functioning, and I believe everyone with a secure diagnosis of AD should be trialed on at least a cholinesterase inhibitor unless contraindicated. All patients and their family should have a secure diagnosis, advice on planning for the future including addressing issues like driving and end of life care, and be linked in to age-appropriate support services.

References

1. Alzheimer’s Australia (2012).

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**THE DA VINCI SURGICAL SYSTEM** Continued from page 1

There is also a large “cost” involved for surgeons to move to this technology – skill acquisition, training, mentoring and initial increased operating times require commitment and effort not just from the surgeon but from the entire OR staff.

There is a large body of evidence that RALP compares well to both ORP and LRP and that it is safe, well tolerated and efficacious for treatment of localised prostate cancer. There is good evidence that blood loss is significantly less than for open surgery, and hospital stay and return to activity are shorter. Despite the enormous uptake of RALP there are no randomised trials which show any significant improvement in other outcomes such as cancer control, continence, and erectile function which are so overwhelmingly affected by other factors such as surgeon skill.

There has been much discussion about learning curves. Any new robotic programme will lag somewhat behind an experienced centre but how long this lasts depends on multiple factors. The experience of the surgeons and their ability to adapt to robotic surgery are probably the most important variables. A focus on training and a comprehensive and coordinated hospital robotic programme will also play a part in reducing the learning curve.

Robotic surgery offers a new tool to the laparoscopic surgeon with more mobile and responsive instruments and better vision. It is a costly tool, and it does not transform a poor surgeon into a good surgeon. It increases what a surgeon can offer the patient, it has advantages, and it is here to stay.

References


The San rated in the top 10 best hospitals around Australia for patient hospital satisfaction, in a recent HCF survey. The survey quizzed 8000 patients and 400 private and public hospitals Australia-wide.

San staff completed the 16 week Global Corporate Challenge in September and ranked 5th most active organisation in the health and medical category in Australia. 70 San staff stepped 80,314km equal to walking twice around the world.

The San’s new innovative e-admissions system is available for San patients. E-Admission has reduced duplication of clerical records resulting in 96% patient satisfaction. See www.sah.org.au

San breast cancer navigators Alison Jones and Jenny Crook and NSCCAHS McGrath Breast Nurse Catrina Ross published a research poster presented at a Nurse Conference in Prague on the relationship between mental health disorders (MHD) and breast cancer treatment completion rates. They found that approximately 1/3 of all MHD affected patients did not complete breast cancer treatments – more than 6 times higher than non-MHD patients.

The San’s annual free carols by Candlelight for the community is on Sunday December 9. See www.sah.org.au or ring 9487 9871.

Supporters of the San Cancer Support Centre fundraised for the San cancer Support Centre during October. The Centre offers free support services for patients and carers, regardless of where they receive their cancer treatment. Breast Cancer Support Groups meet weekly on Tuesday at 1pm. For other groups meeting times and more information see www.sah.org.au/Cancer.

The $181 million Redevelopment at the San is on target to be completed by mid-2014 providing close to an extra 600 car spots, an additional 200 beds, a new Maternity, Women’s Health and Children’s Ward and up to 12 additional operating theatres to cater for the over 50% increase in demand for services expected as the local population ages and increases. The Redevelopment also includes an Integrated Cancer Centre and an Education Centre to house the Sydney Adventist Hospital Clinical School of The University of Sydney and the Avondale College Faculty of Health and Nursing.

The Australasian Research Institute on site at the San is currently undertaking various scientific studies in line with its philosophy of ‘Discovering the Science of Wellness.’ These include:

1. Ethanol increases oxidative damage in brain cells within 10 minutes of drinking the equivalent of one glass of wine:

   Alcohol is a widely used psychoactive depressant that is known to cause damage in the brain but the mechanism is poorly understood. This study found that acute exposure to ethanol at the equivalent blood alcohol level of 0.005% and 0.05% increased oxidative damage by up 145% in human cultured brain cells. This study also showed for the first time that a exposure to 0.05% ethanol for even 10 minutes results in a >40% drop in activity of the nuclear regulator Sir1, a protein now popularly known as the longevity enzyme. This ethanol induced damage may be partly ameliorated by hyper physiological doses of the natural polyphenol resveratrol.

2. A high calorie meal can induce postprandial oxidative stress:

Subclinical oxidative stress and inflammation appear to underpin metabolic diseases such as cardiovascular disease, cancer and diabetes. Research suggests that diets high in fat, and sugar may increase the body’s level of inflammation and oxidative stress.

This present study found that consumption of ice cream reduced antioxidant by 15%, (p<0.05). The sugar component alone reduced antioxidant capacity by 11.3%, (p<0.05). The fat component alone increased lipid peroxidation by 38%, (p<0.05) while the sugar component increased lipid peroxidation by up to 108%. No significant change in oxidative stress or inflammation was observed however after consumption of an isocaloric meal of the whole food avocado. This study showed that consumption of ice cream and its individual fat and sugar components do increase oxidative stress in the body, which may help explain the relationship between the consumption of high calorie foods and risk of vascular disease.

Further queries may be directed to Dr Ross Grant at ross.grant@sah.org.au phone 9487 9602

GP’S ARE INVITED TO ATTEND GRAND ROUNDS AT THE HOSPITAL IN 2013

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<td>12 March</td>
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<td>8 April</td>
<td>Dr Gary Klopfet and others&lt;br&gt;“Torsions, torts and defending the indefensible – a medico legal tale with many twists.”</td>
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Grand Rounds are held in the Level 2 Conference Room from 12.30 – 13.30pm. (Light refreshments available from 12.00pm. Please register on arrival).

DECEMBER

Injury Prevention Month

1 World AIDS Day
9 San Free Carols by Candlelight
25 Christmas Day
26 Boxing Day