AGM Guest Speakers

We have included a detailed report on the talks given by the guest speakers at our AGM on 30th April 2016, especially for those of you who couldn't make it to our meeting.
The PowerPoint presentations of the talks are available to view on our website, you may find it useful to read this report together with their corresponding PowerPoint presentations. These can be viewed from our website http://www.acromegaly.org.nz/meetings

Pituitary Surgery

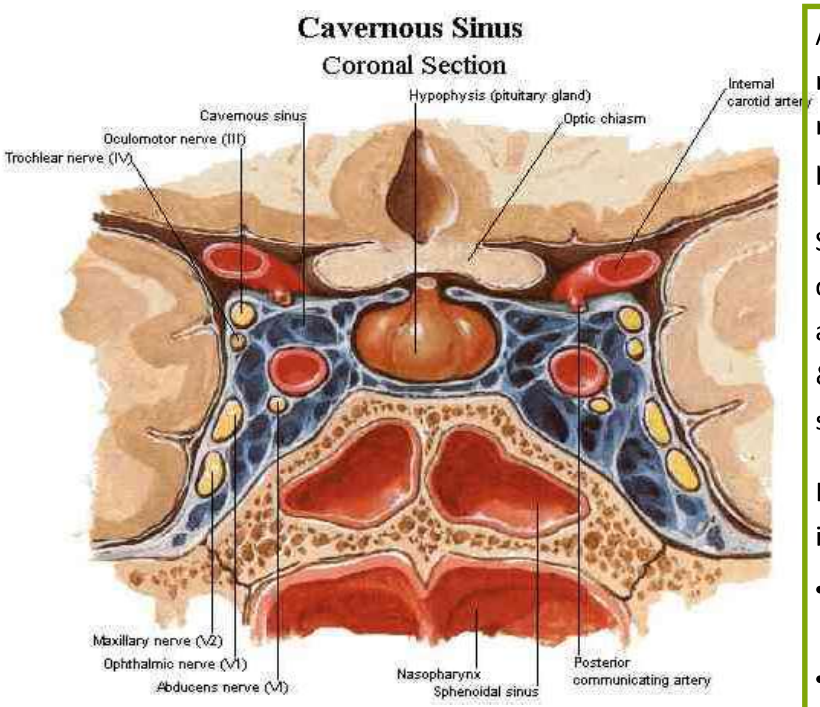
Guest speaker Mr Andrew Law (Neurosurgeon)

Written by Catherine Chan

Mr Andrew Law has been working as a neurosurgeon in New Zealand for 20 years, after training in NZ, Australia and the UK. He is currently working in Auckland City Hospital, Starship Children's Hospital, and has private rooms in Auckland. He is the most experienced pituitary surgeon in the country and performs around 70 pituitary surgeries per year. He had performed near 800 cases since the year 2000, making this the largest pituitary series in the whole of Australasia.

Mr Law has been working in pituitary surgeries in Auckland since year 2000. Back then he used the septal pushover technique with a microscope to see the surgical field. The goal of pituitary surgery is to maximise tumour resection & cure rates, to minimise recurrence & complications, and to preserve normal pituitary function. He progressed to doing endoscopic surgery in 2007, using an endoscope to better locate the pituitary adenoma. The initial cost for the endoscopic kit was around $150,000 which included high definition camera systems that offer better views & techniques. Currently he is moving to performing surgeries in 3D using 2 cameras. He performs around half his cases with an ENT surgeon, especially for those with complicated nasal anatomy.

A useful tool in recent years has been the use of a liquid coagulant consisting of thrombin & particulate powders; once mixed this has the consistency of "toothpaste". A squirt of this 'toothpaste' stops bleeding readily, replacing the need for packing and allowing much better views of the pituitary. Surgeons can now gain access to part of the cavernous sinus (this is a triangular bed of veins sitting on the sides of the pituitary gland – see picture below). With experience, the risk of carotid artery injury is minimised, and can be managed with clips and pads if arterial bleeding occurs. With big tumours that invade far into the cavernous sinus, surgery is still quite difficult, as you can see in the picture below, since further out to the side there are some very important nerves that control eye movements plus other functions. Damaging these can induce double vision, with resulting nausea etc…



http://healthfavo.com/wp-content/uploads/2013/12/cavernous-sinus-anatomy.jpg

As you can see the pituitary gland sits right in the middle of our head at the back of the nose. A normal pituitary gland is about the size of two peas.

Sitting on either side are a bed of veins called the cavernous sinus (in blue). The internal carotid arteries on either side do a U-turn and sit on top & also through the middle of the cavernous sinus.

Further out to the sides you have some very important nerves called the cranial nerves (CN):

- CN III Oculomotor nerve – controls most movements of the eye & raise the eyelid
- CN IV Trochlear nerve – control eye muscle that turns the eye down & out
- CN V Trigeminal nerve is divided into 3 branches. Each branch is responsible for sensation on a different part of the face and controls muscles needed for biting & chewing.

The table on the right shows research into the complications of Transsphenoidal surgery. The rates of complications reduced with the experience of the surgeon. Surgeons who have performed more than 500 pituitary surgeries have consistently lower rates of complications across the board compared to those who have performed less than 200.

Complication	% of Operations Resulting in Complication[a]		
	<200[b]	200–500	>500
Anesthetic complications	3.5	1.9	0.9
Carotid artery injury	1.4	0.6	0.4
Central nervous system injury	1.6	0.9	0.6
Hemorrhage into residual tumor bed	2.8	4.0	0.8
Loss of vision	2.4	0.8	0.5
Ophthalmoplegia	1.9	0.8	0.4
Cerebrospinal fluid leak	4.2	2.8	1.5
Meningitis	1.9	0.8	0.5
Nasal septum perforation	7.6	4.6	3.3
Postoperative epistaxis	4.3	1.7	0.4
Postoperative sinusitis	9.6	6.0	3.6
Anterior pituitary insufficiency	20.6	14.9	7.2
Diabetes insipidus	19.0	NA[c]	7.6
Death	1.2	0.6	0.2

[a] Estimation by participating neurosurgeons.
[b] Number of previous operations.
[c] NA, not applicable.

Complications of transsphenoidal surgery: results of a national survey, review of the literature, and personal experience. Ciric I1, Ragin A, Baumgartner C, Pierce D. Neurosurgery 1997 Feb;40(2):page 225-36

Mr Andrew Law has performed 681 pituitary tumour operations from 2000 to Sept 2015 (the count is close to 800 now). Out of these, 221 were functioning adenomas (tumours that produced excess hormones), and 106 of those were growth hormone producing tumours. Since 2012, the rate of biochemical cure from surgery alone has been 54%, achieving long term remission rate of 80% when combined with other treatments such as medication & radiotherapy.

There are many issues that may affect the success rate of surgery. The bigger the tumour, the more difficult the surgery. If the tumour has invaded into the cavernous sinus surgery is also much more difficult. Mr Law is not a fan of octreotide injections pre-op, as the drug causes the capsule of the tumour to fibrose, making surgery harder, although there is some research to suggest octreotide pre-op may improve cure rates.

The rate of complications from surgery is another topic we were all interested in. The most common being SIADH (Syndrome of inappropriate ADH secretion), which occurs in at least 1/3 of patients post-op. ADH is a hormone stored in the pituitary gland and surgery sometimes causes inappropriate secretion, this leads to water retention and lowering of blood sodium levels. Patients sometimes present weeks after surgery feeling nauseous and confused. Given that SIADH is so common, patients are always warned about the possibility of this occurring. The mainstay of treatment for SIADH is water restriction.

On the other end of the spectrum, diabetes insipidus (DI) can occur post-op. DI is caused by damage to the pituitary stalk causing vasopressin hormone deficiency. DI is the opposite to SIADH, patients pass an excessive amount of diluted urine, accompanied by extreme thirst, which can lead to dehydration & high blood sodium levels. Once recognised this can be treated with medication. Most of the time DI is temporarily and resolves by itself, occasionally this may be permanent.
Other complications include CSF leaks, although the rate of this has much reduced in recent years with

The more experienced the surgeon is with pituitary surgeries, the higher the success rate and the lower the risk of complications

the use of nasal packs for everyone. A full list of potential complications can be found in his presentation, this is available on our website www.acromegaly.org.nz/meetings

It is also of interest that between 6 months to 2 years post-op the scar becomes 'rock solid', and after 2 years the scar softens. Therefore if at all possible surgeons try to avoid this period for repeat operations.

He went on to show us two video clips of pituitary surgery. We were surprised to find out the actual surgery takes around 3 hours, with complicated cases taking up to 6 hours. Also it is unfortunate that we only have 2 nostrils, as it means having to take instruments in & out and having to work in a very tight space! (The videos are available on request, please email catherine@acromegaly.org.nz if you are interested to see these)

Questions & Answers

How much does this surgery costs in his private rooms?

Around $42,000 currently and cover maybe available on health insurance depending on your policy.

Overseas studies have confirmed that the success rate of surgery improves and complication rates reduce with the experience of the surgeon. What is the current set up in NZ?

In Auckland all pituitary surgeries are done by one of two surgeons – Mr Andrew Law or Mr Rob Aspoas (who does around 1/3 of cases). This arrangement is necessary to cover for leave and means both get plenty of cases to build on experience.