Injection Snoroplasty.

Injection Snoroplasty is a relatively new procedure for primary snoring that is caused by vibration of the soft palate and uvula.

There are several procedures available to reduce primary snoring including:

- Uvulopharyngopalatoplasty (UPPP)
- Laser assisted Uvulopharyngopalatoplasty (LAUP)
- Cautery assisted palatal stiffening operations (CAPSO)
- Radio frequency ablation or somnoplasty
- Pillar implants

Injection Snoroplasty is the injection of a sclerosing agent into the soft palate which causes **scarring** and subsequent **stiffening** of the palate. This reduces the flutter of the soft palate which is the primary cause of snoring. The long term efficacy of Injection Snoroplasty appears to be similar to the aforementioned procedures with reasonable expectation of 5 – 10 years symptom free.

Injection Snoroplasty is safe for the first one or two injections but the long term safety of repeatedly scarring of the soft palate is not known.

**BACKGROUND**

Primary snoring results from the vibration of the soft palate and uvula in the roof of the mouth caused by respiration during deep sleep. About 20% of all adults are chronic snorers and of these somewhere between 10 and 50% suffer from significant sleep apnoea. In patients who are significantly overweight or have a short neck or in whom there is any historical evidence of day time somulence, sleep fragmentation, deteriorating cognitive function and performance, formal polysomnography needs to be performed to exclude obstructive sleep apnoea which is, as we all know, a potentially life threatening condition associated with increased prevalence of hypertension, cardiac failure, stroke and early death.

Injection Snoroplasty was first developed by Drs Breitzke and Mair in the late 1990’s. It is performed as an office procedure under local anaesthesia. Firstly
the roof of the mouth is numbed using a local anaesthetic (Xylocaine) spray. This is followed by an injection of a pre mixed solution of 2% Xylocaine and Adrenalin 1:100,000, total injection volume usually being 2-3 ml. Ten minutes thereafter a test dose of 0.1 ml of sodium tetradecyl sulphate (Sotradecol 3%) is injected into the soft palate to test for allergic reaction. If there is no allergic response within 15 minutes the Injection Snoroplasty procedure is then carried out.

During the first treatment the sclerosant is injected by a multiple injection site in the midline of the soft palate from the hard palate to the base of the uvula. The patient is observed for an additional 10 minutes in the surgery and then sent home.

Mild pain killers such as Paracetamol may be required in the first 24 hour period and the patients are encouraged to suck ice.

A telephone survey is undertaken on the first post procedure day and if there are any concerns or if there is excessive pain the patient is reviewed. If all is well they are seen for their first post procedure consultation at 1 month.

The expectation is, that after the initial injection, there is tissue reaction and swelling and the snoring initially gets worse. The snoring usually stabilises after 2 weeks and a slow progression of symptomatic improvement takes place over the next 6 weeks. In the ensuing 6 weeks (between the 6th and 12th week after the procedure) the scar tissue contracts and lifts the palate, the procedure thus having achieved two things, stiffening and shortening to the midline soft palate which usually stops the vibration of the soft palate that leads to snoring.

Patient selection is important. Firstly, as stated before, it is important to exclude anyone with a history suggestive of and/or body physiognomy suggestive of obstructive sleep apnoea. The only effective way to do this is to undertake formal Polysomnography or an overnight sleep study. If the history and clinical examination suggest a diagnosis of primary snoring then appropriate assessment of the upper airway is undertaken using Flexible Fiberoptic Rhinolaryngoscopy.

The patient is asked to snore with the mouth open and with the mouth closed in both the erect and supine positions. It is important to do this to confirm that the major vibrating segment is in fact the soft palate and palatal arch and that tongue ptosis or less common supraglottic or laryngeal causes of snoring are not present.

The main alternatives to Injection Snoroplasty for benign snoring at the moment are:

**Behavior modification** – this involves instructing the patient to lose weight, consume less alcohol, sleep with the head of the bed elevated, avoid sleeping
on their back etc have been found to be universally unsuccessful in the short, intermediate and long term.

**Non surgical alternatives** – the main non surgical alternative is the fitting of a custom made adjustable oral appliance. This fits the teeth and pulls the lower jaw forward to pull the tongue away from the palate and uvula. If compliance with these devices is good, the success rate is good. The average device costs between one and two thousand dollars. Long term usage may be associated with jaw joint or temporomandibular joint problems (M.A.S.).

**Surgical alternatives** – Uvulopharyngopala
toplasty (UPPP) involves surgically trimming the soft palate and uvula and removing the tonsil if appropriate. This enlarges the back of the throat and allows more air flow during breathing and also reduces the amount of floppy soft tissue that can vibrate and cause snoring. It is carried out under general anaesthesia and requires several days in Hospital. The main reason for hospitalisation is for pain control. Uvulopharyngopalatoplasty is a significantly painful procedure and the challenge remains perioperative pain relief or analgesia. For benign snoring in the short term Uvulopharyngopala
toplasty has been shown to be efficacious. However, the long term results indicate the possibility of relapse in terms of snoring. It is not a procedure that should be performed in the presence of moderate or severe obstructive sleep apnoea.

**Laser assisted Uvulopharyngopala
toplasty (LAUP)** uses laser to vaporise the uvula and portion of the palate in an attempt to open or stiffen the airway to eliminate snoring. It can be performed under local anaesthesia but in Australia is more often than not performed under general anaesthesia in an operating room setting. The main indication for using the laser is that theoretically it may be associated with less postoperative pain or discomfort although in our experience that has not been shown to be the case. Long term results for laser assisted Uvulopharyngopalatoplasty are similar to that of conventional surgery or UPPP.

**Cautery assisted palatal stiffening operations** (CAPSA) a procedure carried out where the surgeon uses electrocautery equipment to either remove or stiffen part of the soft palate and uvula. It is usually carried out under general anaesthesia in an operating room setting. The trimming of the soft palate and uvula is quite precise. The scarring and stiffening effect of the electrocautery is not associated with any long term efficacy or follow-up data.

**Radiofrequency ablation** (RFA) or somnoplasty is a technique that uses radio waves to reduce the size of the uvula and to stiffen the soft palate. A needle can be inserted into the tongue base to reduce tongue base mass. It involves piercing the base of the tongue or soft palate with a needle after the application of local anaesthesia and then connecting that needle to a radiofrequency generator. Heat applied to these tissues then destroys cells beneath the surface. When the body absorbs these dead cells the volume of
living tissue is reduced and scar is formed. Radiofrequency ablation is often carried out as an outpatient or in surgery procedure under local anaesthetic but requires multiple sessions of treatment. The advantage of RFA over UPPP or LAUP is that it is minimally invasive, the palatal mucosa is preserved and the surgery is significantly less painful. The long term efficacy of RFA is unknown and in our hands has been disappointing.

**Pillar implants/stents** – there are commercially available a number of Teflon or similar synthetic pillar implants. These are inserted into the soft palate usually at 2 – 3 sites. They serve to act as a pre-formed baton to minimize or eliminate palatal flutter. They are injected via a pre bent needle. The procedure can be performed under local anaesthetic but is often performed in Australia under general anaesthesia in an operating room setting. The procedure is relatively new, the long term results are not available. We have seen several cases where there has been partial or complete extrusion of the implant or inappropriate positioning of the implant submucosally rather than intramuscularly. There is no described complication free technique for removing these implants and although the materials are inert and of biological grade they present certain theoretic problems in terms of their long term stability, migration etc. The procedure is significantly more expensive than Injection Snoroplasty.

The fundamental dichotomy and in fact the most important decision clinicians must make is to differentiate between benign snoring and obstructive sleep apnoea. If there is significant doubt formal Polysomnography or sleep study should be undertaken. In sleep study proven benign snoring primarily due to palatal flutter Injection snoroplasty offers, in appropriately selected cases, a simple and inexpensive “In Office” procedure with a short, intermediate and long term success rate similar to more aggressive and more expensive surgical procedures.

The two main problems of surgery for snoring remain appropriate patient selection, that is to say excluding patients with moderate to severe obstructive sleep apnoea, and the fact that all procedures appear to be associated with a high relapse rate. Most studies suggest that even the best performed surgical procedures including UPPP or LAUP are associated with about a 50% success rate at the 5 year mark, that is to say that 5 years after the initial intervention 50% of people are again experiencing significant snoring. Often this is due to unrelated events such as weight gain or increased alcohol intake but in terms of obtaining informed consent for these procedures it is reasonable to quote 50% 5 year success rate.

**CONCLUSION**

Injection Snoroplasty is not the be all and end all for benign snoring. It is a simple, safe, office based procedure that is appropriate for selected individuals,
offers a success rate which is favorably comparable with more invasive procedures such as Uvulopharyngopalatoplasty or laser assisted Uvulopharyngopalatoplasty, radiofrequency ablation or palatal snoring. It is easy to perform, lacks the risks associated with general anaesthesia and the cost associated with operation room/hospital based procedures. We have been performing the procedure since 2001, have performed over 50 injections and consider the procedure to be an alternative to other treatment methods due to its minimal cost and minimal postoperative discomfort in selected cases.