LASER-ASSISTED UVULOPALATOPLASTY (CHRONIC RHONCOPATHY AND SLEEP APNEA SYNDROME)

Laser-assisted uvulopalatoplasty is a technique perfected by Dr. Y. V. Kamami in France in 1988[1] and introduced into the United States in 1992, where its popularity has continued to grow.

About 85% of the male population older than 50 has snoring problems. The main cause is a vibration of the soft palate and an overly-long uvula that, during inspiration, create an obstacle to the passage of air towards the trachea and lungs, with the consequent sonorous vibration of the tissues. In cases of chronic rhoncopathy, the resulting sleep is of a poor quality and provides little rest, with consequent tiredness upon waking in the morning.

Various systems have been proposed to try and improve the conditions of those suffering from rhoncopathy, but without obtaining satisfactory results.

In 1952, the Japanese Ikematsu was the first person to describe the traditional technique of uvulopalatoplasty, which was to be introduced into the USA by Fujita and Simmons and developed in France, towards the middle of the 1980s, by Dejan and Chouard. The results obtained were satisfactory, with a percentage of successes (elimination or obvious improvement in snoring) of the order of 80%[2].

This treatment is not lacking in risks, however, that are mainly due to the need for a general anaesthetic. Haemorrhages and complications, such as nasal regurgitation of liquids, problems of deglutition, and incomplete open rhinolalia during the first three months after surgery, are also possible. Post-operative pain in the 15 days following the operation can be rather intense and difficult to calm with analgesic drugs. Lastly, complete removal of the uvula may be rather “disfiguring” for the patient.

The procedure perfected by Kamami makes it possible to perform an operation in the outpatients department, which necessitates only a local anaesthetic and lasts from 5 to 20 minutes, depending on the technique chosen and the skill of the surgeon.

It is possible, in fact, to realise the operation in successive degrees, carrying out 4 or 5 five-minute sessions, spaced out at a month’s distance, or in a single session lasting about 15 minutes. The purpose of the intervention is to raise the palatine vault, by utilising the CO_2 laser to remodel the uvula and the veil of the palate.

The operation is performed by utilising an output power of between 20 and 40 W, in continuous manner. For vaporisation, a rapid scanner (already described in other applications) is used so as to reduce the thermal damage to the tissues surrounding those directly hit by the laser beam. The hand-piece used is equipped with a “back stop” system in order to protect the back walls of the oropharynx during the operation.

The technique, which is utilised under local anaesthetic, is totally painless; it respects the physiology of deglutition, and offers the advantage of not immobilising the patient and not causing alterations to his or her voice.

The usual safety regulations relative to the use of a laser must be observed: in fact, protective glasses must be worn and the aspirator of fumes must be positioned directly over the mouth, by means of a special hand-piece.

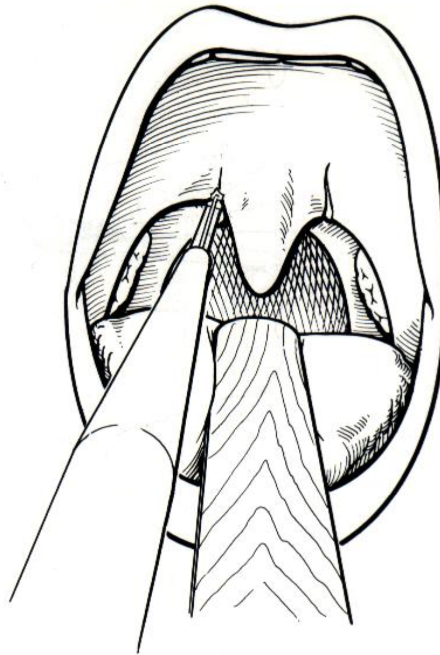

Fig. 29: Incisions of the palate made laterally at the base of the uvula.

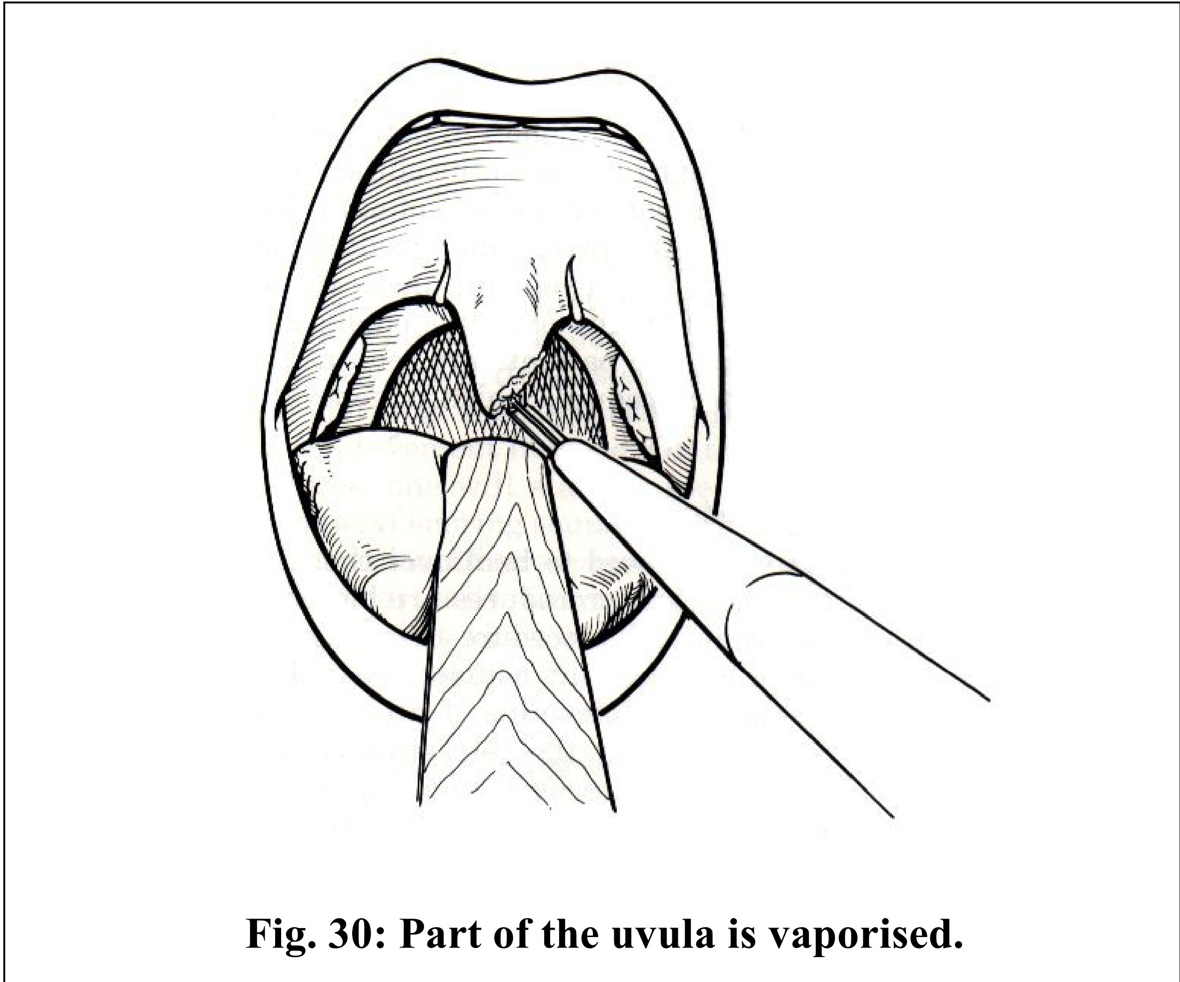

Fig. 30: Part of the uvula is vaporised.

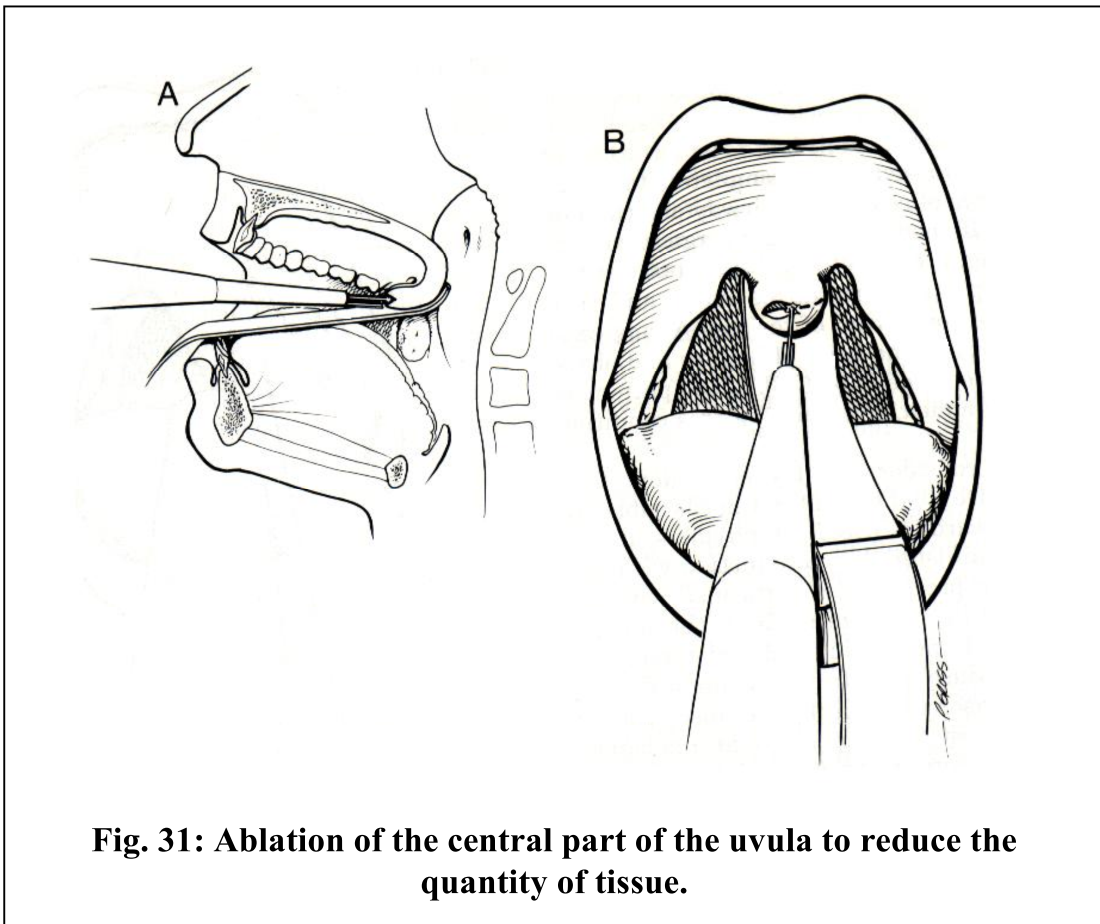

Fig. 31: Ablation of the central part of the uvula to reduce the quantity of tissue.

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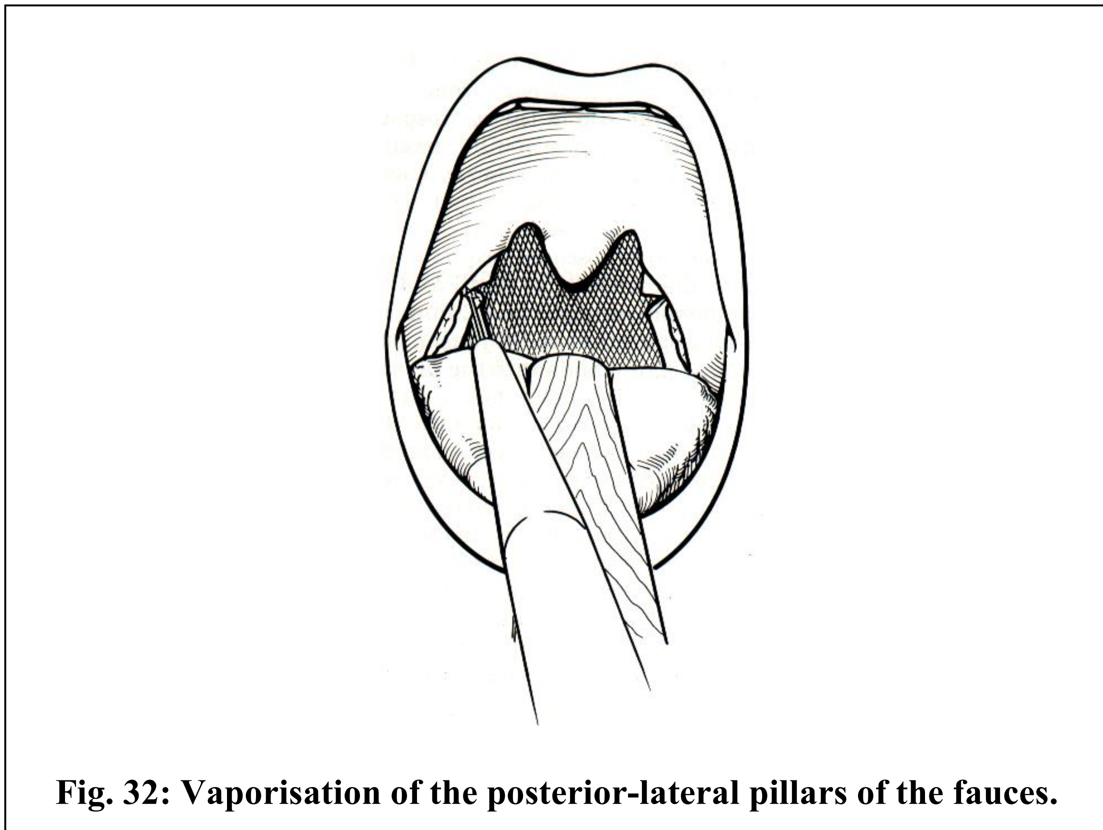

Fig. 32: Vaporisation of the posterior-lateral pillars of the fauces.

Once an adequate level of anaesthesia is obtained, the CO_2 laser is utilised to make two vertical incisions across the palate, laterally to the base of the uvula (figure 29). The length of the back stop serves to establish the depth of the incisions that can be made.

At this point, the length of the uvula is reduced by about 50%, and the uvula is remodelled, giving it a shape that is as equal as possible to a normal one (figure 30), only smaller and positioned higher up. It is possible to bring the point of the uvula more forward and to vaporise its central portion, leaving the mucous membrane intact (figure 31). This method serves to reduce the post-operative pain. The procedure is finished at this point.

Vaporisation can be extended to the palatine tonsils, should these be hypertrophic and contribute with their great volume to the obstruction of the oropharynx and to the posterior-lateral pillars of the fauces (figure 32).

If the choice is made to proceed by successive degrees, the operation is repeated in substantially the same way, at intervals of 3 to 4 weeks. Completion of the procedure is reached when the rhoncopathy is eliminated, or the patient considers himself satisfied with the improvement obtained.

Once the effect of the anaesthesia has worn off, the patient will have a “sore throat” that lasts for about twelve days and which can be attenuated simply by taking prescribed analgesic and anti-inflammatory drugs. In any case, the post-operative pain is not comparable to the much more intense one following a traditional surgical operation.

Very few cases of haemorrhages during or after the operation have been reported, and all have been easily controlled with an electrocoagulator. In several cases, bacterial or mycotic infections have occurred that have required the use of antibiotics. To prevent these infections, however, a covering antibiotic therapy is sufficient.

For a short time after the operation, patients must observe a diet that excludes irritating substances such as spices, vinegar, alcohol, etc.

Except for children and adolescents (who usually do not suffer from chronic rhoncopathy, that is more typical in adults), this operation can be performed on anyone. The only cases in which it is not advisable are extremely obese persons, those suffering from cardiac arrhythmia, and those with serious maxillary-facial anomalies.

The results obtained by Kamami from December 1988 to August 1996[2] (until 1993, the treatment was performed in several sessions, afterwards in a single session) on 1198 patients, controlled at a distance of time with telephone interviews, confirm the efficacy of the technique: in 72% of the patients, the rhoncopathy was completely or almost eliminated; in 23% of the cases, an improvement was reported but with a persistent noise that was not very annoying; in the remaining 5%, the rhoncopathy improved, but a noise remained that was annoying to the sleeping partner.

Controls made on the patients at a distance of time showed that the positive results obtained were usually long-lasting. The few cases of recurrence had a frequency analogous to that reported with traditional uvulopalatoplasty.

Laser-assisted uvulopalatoplasty can be performed also in those cases in which the “snoring” is only a symptom of other pathologies. *Sleep apnea* is the definition given to the appearance of more than 30 apnoeic episodes, each lasting at least 10 seconds, during 7 hours of nightly sleep. This syndrome is caused by an obstruction of the upper air passages at different possible levels, due to the temporary worsening during sleep of pre-existing partially-obstructional situations while awake (particular relaxation and/or length of the palatine veil or pillars, a particularly narrow pharyngeal lumen, a particularly voluminous base of the tongue, and - especially in young children - considerable adenoidal and/or tonsillar hypertrophy). The protracted obstruction of the upper air passages, which is generally associated with snoring, can cause symptoms linked to functional cardio-pulmonary overload, as well as polycythaemia, cardiac arrhythmia, and - in 30-50% of the cases - arterial hypertension. This syndrome may favour the onset of myocardial infarction, cerebral vascular problems, depression, and sexual impotence.

In cases of sleep apnea syndrome, three types of treatment can be indicated, depending on the seriousness of the case:

- medical treatment or CPAP (Continuous Positive Airway Pressure): a mask for the nose is used which sends compressed air to the patient while he sleeps, thus avoiding his going into apnea;
- surgical treatment: performed at the level of the palatine veil, the nose, and the jaws;
- medical-surgical treatment: the operation is always that of laser-assisted uvulopalatoplasty. It is the simplest operational method, but is indicated only in benign or intermediate forms of the sleep apnea syndrome.

Of the 70 cases operated by Kamami from December 1988 to May 1994[2] , 51.4% of the patients obtained a complete healing; 37.2% had a considerable reduction in the total number of sleep apnea episodes; and 11% had no improvement.

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