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The Effect of Carbon Dioxide Insufflation During Transoral Endoscopic Thyroidectomy via a Vestibular Approach on Internal Jugular Vein Pressure Changes: Is There a Safer Alternative?

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Dear Editor,

Transoral endoscopic thyroidectomy via a vestibular approach (TOETVA) is a minimally invasive surgical approach to the thyroid gland which has been shown to be relatively safe but comes with a number of novel complications.[1]

Some studies show that a sudden increase in intra-jugular pressure leads to an increase in intra-ocular pressure.[2,3] These changes are particularly important in glaucoma patients since small changes may have a damaging effect on their vision.[4] Our group has suggested that using a device to modify the standard TOETVA into a gasless 1 might lead to less changes in intra-jugular pressure.

Three Thiel-embalmed cadavers were operated on. This research was conducted after approval by the University of Malta Ethics Committee. Initially a neo-circulation selective to the upper body was developed. A TSD104 A blood pressure transducer (BIOPAC® Systems Inc, Goleta, USA) was used to measure the intra-jugular pressures. Readings were taken: (i) with the subplatysmal space developed but straps still closed; (ii) after opening the strap muscles and performing an isthmusectomy; and (iii) after right hemithyroidectomy. Four minute readings were taken with insufflation pressures of 6 mmHg, 15 mmHg and gasless. The readings were then statistically analyzed using paired t-test analysis.

The mean pressures are presented in Table 1. In all 3 cadavers, insufflation was shown to produce a greater increase in intra-jugular pressures when compared with no insufflation. These differences were reproduced in all of the 3 stages ($P < .0001$).

As the use of TOETVA increases worldwide, it is important to consider not only the cosmetic outcomes but also the safety profile of the procedure. It is pragmatic to move towards gasless modifications of TOETVA.

Author Contributions

Study concept and design: Christian Camenzuli, Pierre Schembri Wismayer, and Jean Calleja-Agius
Acquisition of data: Christian Camenzuli
Analysis and interpretation: Christian Camenzuli, Pierre Schembri Wismayer, and Jean Calleja-Agius
Study supervision: Pierre Schembri Wismayer and Jean Calleja-Agius

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Table 1. Mean pressure difference (in mmHg) from baseline recorded at each stage of the procedure using no insufflation (0mmHg), 6mmHg and 15mmHg insufflation pressures respectively.

	Stage i			Stage ii			Stage iii		
	0 mmHg	6 mmHg	15 mmHg	0 mmHg	6 mmHg	15 mmHg	0 mmHg	6 mmHg	15 mmHg
Cadaver 1	.39	2.39	9.49	2.01	4.89	9.49	1.32	5.79	6.85
Cadaver 2	−.04	2.84	10.9	5.89	8.92	10.69	−.06	4.06	9.91
Cadaver 3	−.38	5.76	8.27	.73	3.06	6.84	−1.32	4.87	11.67

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