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Expert perspectives for transoral robotic versus laser surgery for supraglottic carcinomas

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Abstract

Objective To assess the opinion, practices, and challenges of international key opinion leaders about two minimal invasive surgical techniques in supraglottic laryngeal tumours: transoral laser microsurgery (TLM) and the transoral robotic surgery (TORS).

Methods Design of a questionnaire composed of seven sections and fifty questions covering descriptive data of participants, practitioners experience procedural sequences, considerations related to airways, feeding, and voice, intraoperative haemorrhage, postoperative management, and a comparative analysis of TLM and TORS in treating supraglottic laryngeal cancer.

Results A total of 27 head and neck surgeons replied to the survey. The experts had an average experience in laryngeal surgery of 20.0 ± 9.4 years, ranging from 5 to 36 years. We noted a significantly shorter installation time in TLM compared to TORS (19% of experts estimated the installation time of over 20 min with TLM vs 44% with TORS; $p = 0.02$). According to complications, the experts considered that bleeding was the major concern with supraglottic laryngeal surgery, especially intraoperative bleeding in TLM (52% in TLM vs 26% in TORS) ($p = 0.09$) and postoperative bleeding in TORS (56% in TORS vs 44% in TLM).

Conclusion The experts did not identify a clear superiority of one technology (TLM) over the other (TORS). The two techniques seemed equivalent to the experts, except for the control of intraoperative haemostasis and visualisation of the surgical field, where TORS was perceived as superior to TLM.

Keywords Supraglottic laryngectomy · Laryngeal cancer · Laser CO_2 · Transoral Robotic surgery · Transoral Laryngeal microsurgery · Survey · Endoscopic surgery · Minimally invasive surgery · Head and neck · Carcinomas · Otolaryngology

Introduction

Laryngeal cancer, comprising 1% of global cancer cases, witnessed 189,191 new diagnoses and 103,359 deaths in 2022, securing the 20th and 18th positions, respectively, among cancers worldwide. Squamous cell carcinomas of the larynx are categorized into supraglottic, glottic, and subglottic types based on the affected area [1].

In recent years, advancements in technology have revolutionized ENT surgery, ushering in minimally invasive and endoscopic techniques like Transoral Laser Microsurgery (TLM) and Transoral Robotic Surgery (TORS) for laryngeal and pharyngeal carcinomas. These techniques have profoundly revolutionized the treatment landscape for laryngeal and pharyngeal cancers, offering novel avenues for managing locally confined carcinomas alongside radiotherapy.

For less advanced cT1-T2 tumours, TORS is commonly preferred for oropharyngeal cases, while TLM is favoured for glottic laryngeal tumours. Applied to supraglottic laryngectomies, both methods offer comparable cancer treatment outcomes to radiotherapy and open surgery but with less impact on functionality, thus enhancing patients' quality of life [2–6].

Extended author information available on the last page of the article

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While TLM and TORS have been extensively studied independently, research on their efficacy in treating supraglottic laryngeal carcinoma is scarce. Hence, the comparison between these minimally invasive approaches in managing such cases, except for very rare works published in the literature [7, 8], remains largely unexplored.

To fill this gap, we sought to obtain an overview of the perceived benefits and limitations of these two techniques from selected opinion leaders worldwide using a comprehensive questionnaire. The aim was to assess the opinions, practices and challenges encountered by ENT surgeons regarding the use of TLM and TORS for the treatment of supraglottic laryngeal cancer.

Materials and methods

An online questionnaire using the Google™ Forms platform (Googleplex, mountain View, CA, USA) was designed, specifically intended for experts proficient in both TLM and TORS technologies. This questionnaire was distributed via secured email to an international cohort of experts, chosen based on their distinguished active participation in European (European Laryngological Society, European Head and Neck Society, *Société Française d'ORL*, and the *Societa Italiana di Otorinolaryngoiatra*) and American (American Head and Neck Society and the American Laryngological Society) scientific federations in ENT, laryngology and Head and Neck specialties. All experts were courteously requested to nominate, within their respective countries, national and international federations, individuals whom they deemed proficient in both technologies as second-line experts.

The study was conducted from January 2024 to June 2024.

The questionnaire comprised seven sections and fifty questions covering descriptive data of participants, practitioners experience, procedural sequences, considerations related to airways, feeding, and voice, intraoperative haemorrhage, postoperative management, and a comparative analysis of TLM and TORS in treating supraglottic laryngeal cancer.

Data collection was conducted anonymously, with incomplete responses omitted from the final analysis. Based on the received responses, along with the declarative experts' number of publication records and procedural experience, two distinct responses groups were identified: Group 1 experts and Group 2 experts. Group 1 experts must have had more than 10 cumulative publications within their teams or have conducted more than 50 cumulative surgeries involving both TLM and TORS. In contrast, Group 2 experts exhibited fewer publications and surgical procedures. The h-index for each expert, as determined through Web of Science *(Clarivate™ (Philadelphia, PA, USA))* [9], was reviewed but was not utilized as a distinguishing factor between groups 1 and 2.

Statistical analyses were performed using R (R Foundation for Statistical Computing, Vienna, Austria). The differences between the two expert groups were assessed utilizing Fisher's test, with a significance level of $p < 0.05$.

Results

Composition and perspective of the expert panel

A total of 27 experts in TLM and TORS surgeries were surveyed. First, 10 Key Opinion Leaders (KOL) were initially identified based on their recognized expertise in TLM and TORS surgeries and active participation in European and American Scientific Associations. Subsequently, they facilitated the recruitment of additional experts, resulting in a secondary collection of 17 individuals. In the end, 16 participants were classified into Group 1 experts due to the number of publications from their departments and their declared volume of surgeries performed as described in the Methods section and 11 participants into Group 2 experts (Fig. 1). Consequently, the final cohort consisted of 27 experts, presented according to their h-index in Table 1. The experts had an average experience in laryngeal surgery of 20.0 ± 9.4 years (median: 22.0 ± 9.3 years), ranging from 5 to 36 years. The other attributes of the expert population are presented in Table 1.

According to the experts, the data about their experience and practice of TLM and TORS are presented in Table 2.

Procedures sequences with TLM and TORS according to the expert panel are respectively presented in Tables 3 and 4. No statistically significant difference was found in the incidence of life-threatening experiences between TLM and TORS, with 6/27 (20%) and 10/27 (37%) experts having encountered such events at least once, respectively ($p = 0.3$). Similarly, no significant difference was observed in hospital stays exceeding 4 days: 9/27 (33%) in the TLM group versus 13/27 (48%) in the TORS group ($p = 0.4$).

The attitudes of the expert panel towards bleeding and positive margins in TLM and TORS according to the expert panel are presented in Table 5. Surgical margins were classified as negative when equal to or greater than 3 mm on surgical specimen, close when less than 3 mm but greater than 1 mm and positive when less than 1 mm. A larger number of experts reported systematically performing re-excisions with the robot—21/27 (78%)- compared to the laser—15/27 (55%)—($p = 0.1$).

The postoperative management after TLM and TORS according to the expert panel is presented in Table 6.

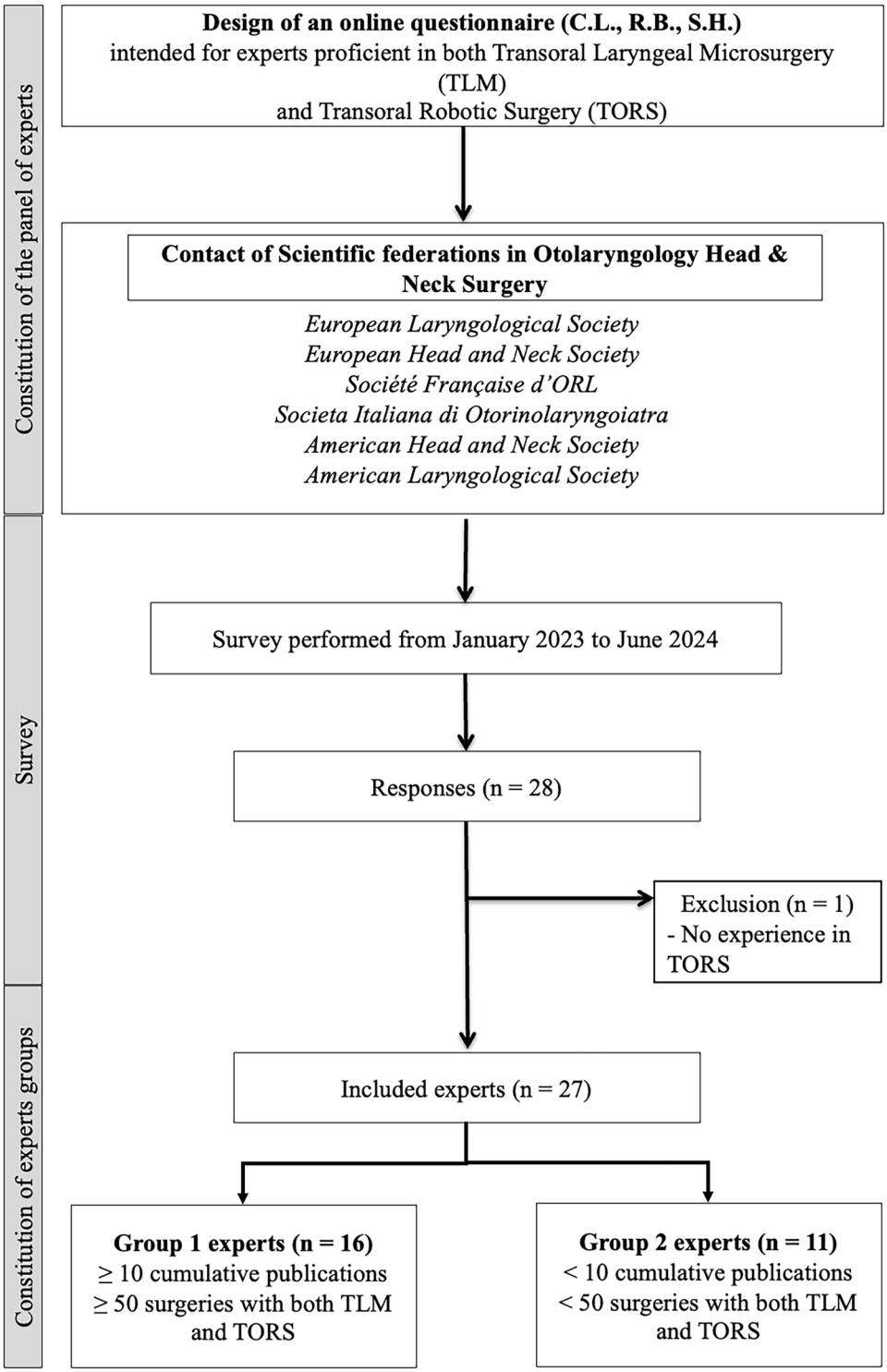


Fig. 1 Chart. Experts' selection

Comparative perspective towards TLM and TORS according to the expert panel

Based on their insights and experience, the experts noted a significantly shorter installation time in TLM compared to TORS (19% of experts estimated the installation time of over than 20 min with TLM vs 44% with TORS) ($p = 0.02$) (Fig. 2). However, a significantly larger proportion of experts noted that TLM necessitates frequent interruptions of the procedure to re-expose the larynx, unlike TORS (67% vs 19%) ($p = 0.01$) (Fig. 2).

Table 1 Expert panel characteristics

Classification of experts according to their h-index score	Hans S, France—40	De Mones del Pujol E, France—19
	Ansarin M, Italy—29	Choussy O, France—18
	Vilaseca I, Spain—29	Ceruse P, France—18
	Golunsiñski W, Poland—27	Tagliabue M, Italy—17
	Fakhry N, France—26	Gorphe P, France—17
	Garrel R, France—26	Saroul N, France—13
	Malard O, France—26	Atallah S, France—9
	Meccariello G, Italy—26	Villeneuve A, France—7
	Pellini R, Italy—26	Baudouin R, France—6
	Burkey, USA—25	Bizeau A, France—6
	Vergez S, France—25	Lorentz C, France—3
	Dolivet G, France—24	Couineau F, France—3
	Giger R, Switzerland—22	Barbut J, France—2
	Moriniere S, France—22	
H-index score median and standard deviation	22 ± 10	

Outcomes	All (27)	Group 1 (16)	Group 2 (11)	*p*-value
Gender (F/M)	4/23	2/14	2/9	1
Age (mean ± SD, years)	50 ± 10	50 ± 10	50 ± 10	0.9
Country of practice				1
France	19 (70)	11	8	
Not France	8 (30)	5	3	
Member of a cancer society	23 (85)	14 (88)	9 (82)	1
Nature of main practice				0.1
University Hospital	21 (78)	14 (88)	7 (64)	
Non-Teaching hospital	3 (11)	0 (0)	3 (27)	
Private practice	3 (11)	2 (13)	1 (9)	
No. of publications by center				
More than 10 about SGL-TLM	3 (11)	2(13)	1 (9)	1
More than 10 about SGL-TORS	4 (17)	3 (19)	1 (9)	0.6
TLM experience				
More than 10 years of practice	19 (70)	12 (75)	7 (64)	0.7
No. of procedure per year (median ± IQR)	10 ± 11	10 ± 14	7 ± 10	0.7
TORS experience				
More than 10 years of practice	9 (33)	7 (44)	2 (18)	0.2
No. of procedure per year (mediane ± IQR)	5 ± 8	7 ± 7	3 ± 4	0.1

Abbreviations: *TLM* Transoral Laryngeal Microsurgery, *TORS* Transoral Robotic Surgery, *SGL-TLM* Supraglottic Laryngectomy with TLM, *SGL-TORS* Supraglottic Laryngectomy with TORS. h-index score calculation was provided by Clarivate™ (Philadelphia, PA, USA) website: Web of Science (https://support.clarivate.com/ScientificandAcademicResearch/s/article/Web-of-Science-h-index-information). Group 1 experts were characterized by having more than 10 cumulative publications within their teams or having conducted more than 50 cumulative surgeries involving both TLM and TORS. Group 2 experts exhibited fewer publications and surgical procedures

Table 2 Expert panel experience

Outcomes	All (27) No. (%)	Group 1 (16) No. (%)	Group 2 (11) No. (%)	*p*-value
Anterior supraglottic laryngectomy (epiglottectomy) with TLM	27 (100)	16 (100)	11 (100)	1
Anterior supraglottic laryngectomy (epiglottectomy) with TORS	24 (89)	14 (88)	10 (91)	1
Lateral supraglottic laryngectomy with TLM	25 (93)	15 (94)	10 (91)	1
Lateral supraglottic laryngectomy with TORS	23 (85)	14 (88)	9 (82)	1

TLM Transoral Laryngeal Microsurgery, *TORS* Transoral Robotic Surgery

Table 3 Procedure sequence with Transoral Laryngeal Microsurgery according to the expert panel

Outcomes	All (27) No. (%)	Group 1 (16) No. (%)	Group 2 (11) No. (%)	*p*-value
Average set-up time				0.2
5–10 min	12 (44)	9 (56)	3 (27)	
10–15 min	7 (26)	4 (25)	3 (27)	
15–20 min	3 (11)	2 (13)	1 (9)	
> 20 min	5 (19)	1 (6)	4 (36)	
Using CO_2 laser	27 (100)	16 (100)	11 (100)	1
Frequently need to re-expose	18 (67)	11 (69)	7 (64)	1
Routinely perform a transoral superior laryngeal artery cautery/clipping	14 (52)	10 (63)	4 (36)	0.2
Routinely perform a cervical dissection	13 (48)	8 (50)	5 (45)	1
Have experience life-threatening complications	6 (22)	4 (25)	2 (18)	1
Preventive tracheotomy	2 (7)	1 (6)	1 (9)	1
Preventive feeding tube	15 (56)	9 (56)	6 (55)	1

Table 4 Procedure sequence with Transoral Robotic Surgery according to the expert panel

Outcomes	All (27) No. (%)	Group 1 (16) No. (%)	Group 2 (11) No. (%)	*p*-value
Average set-up time				0.05
5–10 min	1 (4)	1 (6)	0 (0)	
10–15 min	6 (22)	6 (38)	0 (0)	
15–20 min	8 (30)	3 (19)	5 (45)	
> 20 min	12 (44)	6 (38)	6 (55)	
Using FK retractor	19 (70)	13 (81)	6 (55)	0.2
Frequently need to re-expose	5 (19)	3 (19)	2 (18)	1
Routinely perform a transoral superior laryngeal artery cautery/clipping	21 (78)	12 (75)	9 (82)	1
Routinely perform a cervical dissection	14 (52)	9 (56)	5 (45)	0.7
Have experience life-threatening complications	10 (37)	7 (44)	3 (27)	0.4
Preventive tracheotomy	7 (26)	2 (13)	5 (45)	0.08
Preventive feeding tube	17 (63)	10 (63)	7 (64)	1

FK Feyh-Kastenbauer® (Gyrus Medical Inc., Tuttlingen, Germany)

Regarding the preventive control of haemostasis during supraglottic laryngeal surgery, an equal number of experts performed cervical dissection (13/27, 48%) in both TLM and TORS ($p = 1$). However, a higher proportion, 21/27 (78%), routinely clipped the superior laryngeal artery during the procedure in TORS compared to 14/27 (52%) in TLM ($p = 0.08$).

A comparable proportion of experts reported experiencing a self-estimated "life-threatening complication" during surgery between TLM and TORS (6/27 (22%), vs 10/27 (37%)) ($p = 0.4$).

A minority of experts routinely conducted preventive tracheostomy for supraglottic laryngeal surgery in TLM (2/27 (7%)), while in TORS, the number was slightly higher (7/27 (26%)) ($p = 0.1$).

On the contrary, consensus regarding the placement of a nasogastric feeding tube was lacking, with a half to two thirds of the experts opting to place the feeding tube in both procedures (15/27 (56%) in TLM vs 17/27 (63%) in TORS) without any significant difference between the surgeries.

In the event of intraoperative major bleeding, a proportion of 22/26 (85%) in TLM compared to 21/26 (81%) in TORS ($p = 1$) attempted to transorally approach the bleeding. Additionally, 7/26 (27%) in TLM versus 9/27 (35%) in TORS ($p = 0.8$) performed an immediate cervicotomy to access the external carotid branches and the superior laryngeal artery. Finally, 12/26 (46%) in TLM versus 14/26 (54%) in TORS ($p = 0.8$) systematically performed a tracheotomy.

Based on their insights and experience, the experts considered that bleeding was the major concern with

Table 5 Attitude towards bleeding and margins status in Transoral Laryngeal Microsurgery and Transoral Robotic Surgery according to the expert panel

	All (26) No. (%)	Group 1 (15) No. (%)	Group 2 (11) No. (%)	*p*-value
Attitude towards major bleeding with TLM				
Approach the superior laryngeal artery via the transoral approach	22 (85)	14 (93)	8 (73)	0.2
Immediate cervicotomy to control the external carotid branches (lingual, thyroid arteries)	7 (27)	4 (27)	3 (27)	1
Systematically perform tracheotomy	12 (46)	5 (33)	7 (64)	0.2
Attitude towards major bleeding with TORS				
Approach the superior laryngeal artery via transoral approach	21 (81)	13 (87)	8 (73)	0.6
Immediate cervicotomy to control the external carotid branches (lingual, thyroid arteries)	9 (35)	5 (33)	4 (36)	1
Systematically perform tracheotomy	14 (54)	7 (47)	7 (64)	0.5
Attitude towards margins in TLM				
Performing perioperative systematic recuts	15 (55)	9 (56)	6 (55)	1
Attitude in case of positive margins (< 1 mm)				0.4
Surgical revision	7 (26)	13 (81)	7 (64)	
Radiotherapy	0 (0)	3 (19)	4 (36)	
Wait and see	20 (74)	0 (0)	0 (0)	
Attitude in case of close margins (1–3 mm)				0.3
Surgical revision	5 (19)	3 (19)	2 (18)	
Radiotherapy	2 (7)	0 (0)	2 (18)	
Wait and see	20 (74)	12 (81)	7 (64)	
Attitude towards margins in TORS				
Performing systematic recuts	21 (78)	12 (75)	9 (82)	1
Attitude in case of positive margins (< 1 mm)				0.5
Surgical revision	18 (67)	11 (69)	7 (64)	
Radiotherapy	7 (26)	3 (19)	4 (36)	
Wait and see	2 (7)	2 (13)	0 (0)	
Attitude in case of close margins (1–3 mm)				0.3
Surgical revision	5 (19)	3 (19)	2 (18)	
Radiotherapy	2 (7)	0 (0)	2 (18)	
Wait and see	20 (74)	13 (81)	7 (64)	

LM Transoral Laryngeal Microsurgery, *TORS* Transoral Robotic Surgery

supraglottic surgery with no significant difference between the surgeries but with trends, especially intraoperative bleeding in TLM (14/27 (52%) vs 7/27 (26%) in TORS) and postoperative bleeding in TORS (15/27 (56%) vs 12/27 (44%) in TLM). The experts considered granuloma formation and oedema as type of procedure-specific complications. Granulomas were more common in TLM (6/27, 22%) compared to TORS (1/27, 4%). Conversely, oedema was more frequently observed in TORS (7/27, 27%) than in TLM (3/27, 11%). However, these differences did not reach statistical significance. The authors reported that the other complications studied (swallowing disorders, pneumonia by aspiration, synechia, stenosis, chondritis, need for a transient feeding tube, need for a transient tracheostomy and voice disorders) were similarly distributed between TLM and TORS. The primary complications to consider were, in decreasing order of frequency, bleeding, swallowing disorders, and pneumonia by aspiration.

Regarding the best choice of technology for managing supraglottic carcinomas between TLM and TORS, the two techniques appeared equivalent to the experts, except for intraoperative hemostasis control and visualization of the surgical field. In these aspects, TORS was perceived as superior to TLM. These findings are summarized in Fig. 2.

Discussion

A targeted survey was conducted among experts with significant experience in transoral supraglottic laryngeal surgery using laser and robotic techniques. We brought together 27 American and European experts, considered Key Opinion

Table 6 Postoperative course after Transoral Laryngeal Microsurgery and Transoral Robotic Surgery according to the expert panel

	All (27) No. (%)	Groupe 1 (16) No. (%)	Groupe 2 (11) No. (%)	*p*-value
Outcomes in TLM				
Duration before resuming oral feeding				0.8
< 24 h	7 (26)	4 (25)	3 (27)	
24–48 h	15 (55)	8 (50)	7 (64)	
> 48 h	5 (19)	4 (25)	1 (9%)	
Postoperative standardized protocol	17 (63)	13 (81)	4 (36)	0.04*
Speech therapy during hospitalization	25 (93)	15 (94)	10 (91)	1
Speech therapy after hospitalization	26 (96)	15 (94)	11 (100)	1
Systematic postoperative antibiotics	13 (48)	8 (50)	5 (45)	1
Systematic postoperative corticosteroids	15 (55)	9 (56)	6 (55)	1
Average length of hospitalization				0.7
< 2 days	1 (4)	0 (0)	1 (9)	
2–4 days	17 (63)	10 (63)	7 (64)	
> 4 days	9 (33)	6 (38)	3 (27)	
Outcomes in TORS				
Duration before resuming oral feeding				0.7
< 24 h	3 (11)	2 (13)	1 (9)	
24–48 h	16 (59)	8 (50)	8 (73)	
> 48 h	8 (30)	6 (38)	2 (18)	
Postoperative standardized protocol	19 (70)	15 (94)	4 (36)	0.002*
Speech therapy during hospitalization	25 (93)	15 (94)	10 (91)	1
Speech therapy after hospitalization	26 (96)	15 (94)	11 (100)	1
Systematic postoperative antibiotics	15 (55)	10 (63)	5 (45)	0.5
Systematic postoperative corticosteroids	15 (55)	11 (69)	4 (36)	0.1
Average length of hospitalization				0.4
< 2 days	0 (0)	0 (0)	0 (0)	
2–4 days	14 (52)	7 (44)	7 (64)	
> 4 days	13 (48)	9 (56)	4 (36)	

TLM Transoral Laryngeal Microsurgery, *TORS* Transoral Robotic Surgery

Leaders and surgeons skilled with these both surgical technologies, distinguishing between two groups based on their declared experience. This survey showed that the experts did not identify a clear superiority of one technology over the other. Both TLM and TORS remain associated with patient safety concerns. Notably, more experts reported life-threatening complications during TORS, or concerns about the risk of oedema and bleeding, although the differences observed between results were not statistically significant. This paradox explains the heterogeneity of responses concerning the implementation of a temporary tracheostomy and a feeding tube in TORS.

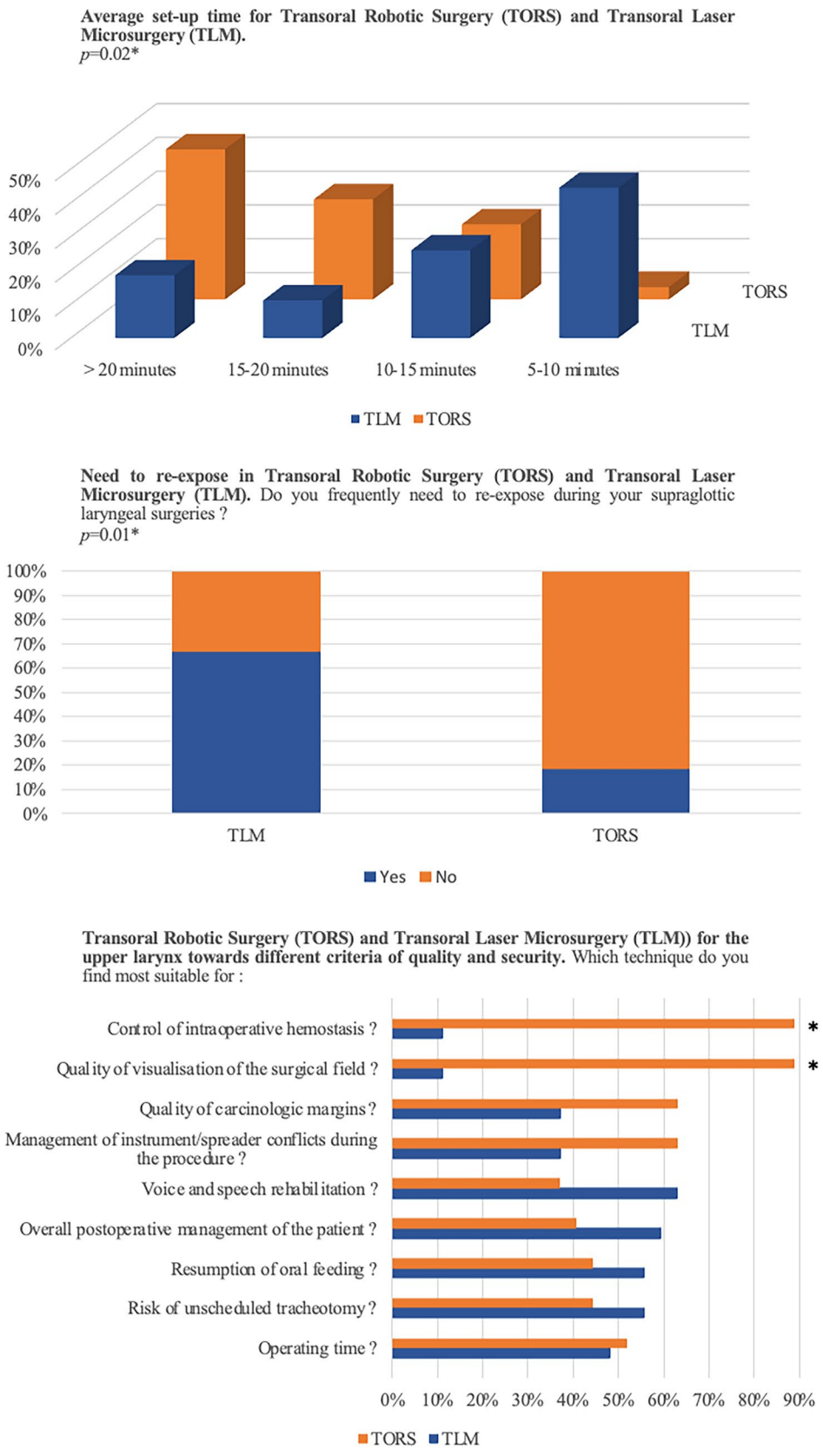
However, significant series have demonstrated the absence of necessity for systematic tracheotomy and feeding tube [10, 11], provided there is a standardised postoperative management protocol and intervention by speech therapists [12]. Regarding these two elements, which appear essential for patient care, the experts acknowledge that not all have this experience in their services.

In terms of implementation, however, the experts seem to agree that TLM is faster to set up compared to TORS but more challenging in terms of re-exposure of the suspended laryngoscope during the procedure. This consideration implies that TLM requires intraoperative re-exposure that the robot setup does not.

The cost of the technologies was not evaluated during this survey, but literature data seems to indicate that acquiring the robot and its use by dedicated personnel is more expensive than using TLM [13]. Furthermore, TLM is additionally indicated for managing epithelial lesions, whether cancerous or non-cancerous, of the vocal cord by cordectomy, more frequently than the management of pharyngeal carcinomas by TORS, depending on the centers' recruitment.

The distinction between Group 1 and 2 among the experts was necessitated by the significant heterogeneity in

Fig. 2 Expert Perspectives for Transoral Robotic (TORS) versus Laser Surgery (TLM) for Supraglottic Carcinomas: significant results



their profiles, as evidenced by the substantial discrepancies in their h-index scores. Between the two levels of expert Groups, only two pertinent differences in practice and perspective towards TLM and TORS were found. Firstly, the importance of experience [14, 15] in TORS was confirmed, with a part of Group 2 experts considering themselves slower than the Group 1 group in setting up the robot, a difference not found in TLM where the learning curve for setup is reported to be faster [16, 17]. Secondly, more Group 1 expert provided their patients with a standardised feeding and speech therapy protocol.

The implementation and mastery of these two surgical technologies—TLM and TORS—are rare and highly dependent on the centers. They require advanced equipment for the institution and specialized training for individuals. The availability of surgical robots is less common than lasers, which are also more cost-effective. Additionally, the learning curve differs between these technologies [13, 14, 16–18] and the incidence of supraglottic laryngeal tumours, which can be treated with these techniques, is relatively low. Indeed, these cases are typically referred to specialized centers. Due to these factors, a broad-based survey was impractical. Instead, we adopted a controlled, two-step approach: first, by disseminating the survey to indisputable experts and opinion leaders within their scientific societies, and then by co-opting individuals whose surgical practices aligned with the focus of the survey. The clear advantage of this method is the assurance that we only engaged with experts or surgeons experienced in both techniques.

However, the French surgeons represented a larger group, with a maximum of 3 surgeons from any single institution and all 19 French participants coming from 15 different institutions across France. This numerical dominance is attributed to easier communication and closer ties to the pilot team, which led to an imbalance compared to the foreign members, particularly the North Americans. Despite this, the integrity of the data is upheld, as each response was provided by a verified expert, recognized for their proficiency in both surgical techniques being studied. Another drawback is the inability to estimate how many eligible surgeons did not respond, despite being proficient in both methods.

Patient selection is essential for the effective use of the discussed innovative techniques. Although the 'T' in the TNM classification is important, it does not fully capture the nuances of supraglottic tumours, particularly the distinction between median and lateral tumours. This differentiation, as described by the European Laryngological Society's classification of Supraglottic Endoscopic Resections [19] is crucial for optimal management.

In addition to achieving complete resection, the treatment of supraglottic squamous cell carcinoma requires greater tissue conservation through functionally conservative surgical procedures, thereby preserving quality of life. Alongside radiotherapy and its favourable carcinologic outcomes [20, 21], open surgeries may be perceived as overly debilitating, depending on the initial assessment of the patients and their tumours [22, 23]. In contrast, transoral surgery has its place for cT1 and cT2 supraglottic laryngeal tumours as it allows complete carcinologic excision sparing radiotherapy [3, 24]. This factor is particularly interesting for preventing long-term post-radiation effects [5] and for preserving a large available therapeutic arsenal if a recurrence or cancer in another head and neck location necessitates irradiation.

This study shows that even within an internationally group of experts, opinions do not seem unanimous on the implementation methods of TLM and TORS for managing supraglottic tumours. This experience, alongside existing literature [8, 10, 25, 26], is an essential prerequisite for considering the establishment, by consensus, of specific guidelines for the transoral surgical management of supraglottic laryngeal tumours by laser or robot.

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Declarations

Conflict of interest The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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