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Timing of neck dissection in patients undergoing transoral robotic surgery for head and neck cancer

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Abstract

Background: Oncologic transoral robotic surgery (TORS) requires in most cases the concurrent or staged surgical treatment of the regional lymph nodes in the neck as well. The purpose of this study was to determine whether the timing of the regional lymphadenectomy (neck dissection) has an impact on the surgical outcomes and on the complication rates.
Methods: Single-institution, prospective case series with internal control group. Twenty-one patients underwent TORS and appropriate neck dissection concurrently (control group), while 20 patients underwent neck dissection in a timely staged fashion, 8.4 days (median; range, 3–28 days) following their TORS procedure (experimental group). Outcome measures included nodal yield, intraoperative pharyngocervical fistula formation, postoperative fistula formation, postoperative bleeding from the primary and from the neck dissection site, haematoma, seroma, and infection.
Results: Nodal yield values, as the oncologic quality indicator of a neck dissection, were comparable in the experimental and in the control group. Complication rates did not differ between the groups: intraoperative and postoperative fistula formation, postoperative bleeding, haematoma and seroma rates were similarly low in the two groups. There was no infection in either group.
Conclusions: In the present cohort of 41 TORS-patients, the timing of neck dissection did not make a significant difference in the outcomes. We suggest therefore that aspiring and established TORS-teams do not restrict their appropriate indications due to robotic slot and theatre time constraints, but perform each indicated TORS-case as soon as possible within their given systems, even if the neck dissections cannot be done on the same day.

Keywords: Head and neck squamous cell carcinoma (HNSCC); Transoral robotic surgery (TORS); Neck dissection; Pharyngeal fistula; Nodal yield

Introduction

Transoral robotic surgery (TORS) for T1 and T2 head and neck squamous cell carcinoma (HNSCC) has become an established primary treatment option in the oropharynx, hypopharynx and supraglottic larynx in Europe[1–3] and worldwide.[4–9] The surgical treatment of oropharyngeal, hypopharyngeal and laryngeal cancer frequently includes the appropriate regional lymphadenectomy of the neck, also known as neck dissection (ND). However, the ideal timing of neck dissection in TORS-patients remains controversial, where the priority of the assumed oncological advantages of a concurrent procedure is often challenged by obvious time constraints, especially in Europe, where the robot is available for most head and neck departments only in limited time slots weekly or even fortnightly.

Besides the low level evidence in the literature[10–12] regarding the best timing of neck dissection for patients undergoing TORS for their primary disease, there are some common sense considerations about the advantages and disadvantages of concurrent and staged neck dissections in this context.

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Performing the neck dissection in the same general anaesthesia as the TORS procedure (concurrent ND) may provide with some benefits. As the definitive treatment for the primary tumour and for the neck lymph nodes can be done in a single session, it is more convenient for the patient, may reduce the overall anaesthetic risk of the procedure, the hospitalization time, and the associated costs as well. Further, the concurrent ND would incur no delay in patient progress towards a possibly necessary adjuvant therapy. Another argument is the option for vessel ligation during the neck dissection to prevent postoperative bleeding from the primary TORS-resection site, upon the surgeon's preference,[6] and the possibility to conveniently include an elective, temporary tracheotomy into the neck incision, should the latter be necessary for airway safety.

In contrast, the staged neck dissection, i.e. a ND performed in a time interval after the primary tumour resection, may have some other advantages. These include a possibly less frequent intraoperative pharyngocervical fistula formation, more convenient theatre list planning – including the distribution of robotic slots among the involved departments, the opportunity to address close or positive resection margins reported in the final histopathology after TORS, and the possibility to close a tracheotomy if it was done during the TORS-procedure previously. A delayed neck dissection may even prevent an elective tracheotomy during the primary TORS-session, by reducing laryngopharyngeal mucosal swelling due to the untouched outer neck.

This issue is well known to the European TORS-community. In our practice, at the beginning, our firm intention was to do all neck dissections on the same day, and we did so with our first 21 TORS-patients. With two robotic cases on the same list, some of them requiring bilateral neck dissections, this practice stretched the limits of our scrub nurses and the anaesthesia team, especially at the beginning of our robotic learning curve when patient turnover, patient positioning, docking the robot and robotic console work took much longer time than it does today. For this reason, we changed our practice and started to do the neck dissections in a timely staged fashion. The purpose of the present study was to provide our institutional experience on the safety and efficacy of staged versus concurrent ND, with special regards to intraoperative pharyngocervical fistula rate, postoperative complications and number of harvested lymph nodes.

Patients and methods

In this study, a total of 41 patients were included with TORS as their primary treatment for HNSCC. Twenty-one patients were defined as the control group, consisting of those treated with a concurrent ND during the same session with TORS. The experimental group included 20 patients undergoing a timely staged ND with a median time interval of 8.4 days (range, 3–28 days) following their TORS procedure. The patients' demographic characteristics, distribution of their primary tumour sites and the pathological TNM staging in the control group as well as in the experimental group are detailed in Table 1.

TORS procedures

After obtaining informed consent, all patients underwent transoral robotic-assisted resection for their oropharyngeal or hypopharyngeal primary tumour using the da Vinci Surgical System (Intuitive Surgical, Inc., Sunnyvale, CA, USA), as described previously by Lörincz et al.[1,2] The lateral superior or medial pharyngeal constrictor muscles were partially resected with the tumour en bloc, when oncologically required. The clear margin status of each TORS-resection was confirmed by means of intraoperative frozen section histology; in cases with close or involved margins, an immediate re-resection was performed subsequently, during the same robotic session. A soft silicone nasogastric feeding tube was placed at the end of each TORS-procedure, still in general anaesthesia.

Following TORS, patients were kept intubated for one night at the intensive care unit to prevent the possible consequences of mucosal swelling and/or postoperative bleeding, except those cases managed with elective temporary tracheotomy, which was only performed in 3 high-risk patients.[2]

Table 1
Patient characteristics.

Variable	Control group	Experimental group
	No. of patients (%)	No. of patients (%)
Cohort	21	20
Sex		
Male	16 (76.2)	15 (75.0)
Female	5 (23.8)	5 (25.0)
Age, years	(median 63.9, range 52–81)	(median 66.9, range 47–83)
<65	11 (52.4)	8 (40.0)
≥65	10 (47.6)	12 (60.0)
Tumour site		
Oropharynx	19 (90.5)	14 (70.0)
Base of tongue	6 (28.6)	5 (25.0)
Tonsillo-lingual angle	4 (19.0)	2 (10.0)
Tonsil	8 (38.1)	5 (25.0)
Soft palate	1 (4.8)	2 (10.0)
Hypopharynx	2 (9.5)	6 (30.0)
Piriform fossa	2 (9.5)	6 (30.0)
pT classification		
T1	9 (42.9)	7 (35.0)
T2	12 (57.1)	9 (45.0)
T3	0	4 (20.0)
pN classification		
N0	9 (42.9)	5 (25.0)
N1	5 (23.8)	7 (35.0)
N2a	1 (4.8)	0
N2b	4 (19.0)	6 (30.0)
N2c	0	2 (10.0)
N3	2 (9.5)	0
TNM stage		
I–II	8 (38.1)	4 (20.0)
III–IV	13 (61.9)	16 (80.0)