Original Article

Functional outcomes and quality of life in patients who undergone conventional or endoscopic/robotic retroauricular neck dissection: a case-control study

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Background: Neck dissection performed via retroauricular approach emerged as an alternative to the conventional approach, aiming to maintain therapeutic efficacy with lower postoperative morbidity. Differences among these modalities in terms of functional aspects and quality of life (QOL) remains unclear. This study aims to evaluate the anatomical and functional aspects and the QOL in patients undergoing unilateral neck dissection via conventional or retroauricular (endoscopic or robotic) access.

Methods: This study involved consecutively 35 patients who underwent unilateral neck dissection for head and neck cancer, 25 submitted to the conventional surgery [conventional group (CG)] and 10 to the retroauricular approach [retroauricular group (RG)]. Patients were evaluated preoperatively and on the 30th postoperative day (POD) regarding range of motion (ROM) of the cervical spine and shoulder, trapezius muscle strength and QOL.

Results: The CG and RG were similar in terms of anthropometric, clinical and surgical variables. The mean age of both groups was between 52 and 55 years old. There was a predominance of females in the CG (52%) and males in the RG (70%); P=0.08. The most affected site was the oropharynx followed by the thyroid in the two groups and the most frequently dissected levels were I-III in both groups. There was a difference in the length of hospital stay {CG: 5 [1–22] days and RG: 2 [1–6] days; P=0.02} and pain scores at the 30th POD was higher in CG group (P=0.002). Regarding the cervical spine ROM, it was better in RG in the 30th POD for neck extension, ipsilateral lateroflexion, contralateral lateroflexion and contralateral rotation (P<0.05). No significant differences were found regarding shoulder ROM. Trapezius muscle strength, was also higher at the 30th POD in RG group (P<0.05). QOL was most impacted in the CG in the Chewing and Shoulder domains and Physical Function dimension at the 30th POD (P<0.05).

Conclusions: Postoperative functional morbidity was lower in patients undergoing retroauricular neck dissection. The cervical spine ROM and trapezius muscle strength were better in patients undergoing retroauricular approach and postoperative QOL was worse in patients undergoing conventional neck dissection.

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Introduction

In head and neck cancer population, elective or even therapeutic selective neck dissection (SND) has been established as a safe, effective, and less morbid option than radical neck dissection (RND) when properly applied (1). However, despite their less mutilating characteristic, these procedures could significantly impact the patient's daily life due to large cervical incisions, manipulation of cervical muscles and nerves and changes in neck lymphatic drainage (2).

Pain, reduced range of motion (ROM) in the cervical spine and shoulder, changes in sensitivity and worse quality of life (QOL) are functional complications frequently reported by neck dissection patients, varying in intensity according to the extent of the procedure performed (3). Important functions such as speech, swallowing, breathing, smell and taste may be compromised, especially in the context of the presence of temporomandibular disorders, further compromising functionality and QOL (4).

Efforts to limit the aesthetic and psychological consequences of conventional access have boosted the development of different remote access approaches to the neck, such as transaxilar and retroauricular access (5). Of these, the retroauricular approach emerged as the most versatile option, as it allows adequate dissection of all levels of the ipsilateral neck (2). Neck dissection by retroauricular approach has been shown to be similar to the conventional technique in terms of oncological and surgical effectiveness, assessed by the number of retrieved lymph nodes, ipsilateral and regional nodal recurrence rates and the incidence of postoperative complications, however, with a shorter hospital stay (6,7).

Remote approach SND compared to the conventional technique for oral squamous cell carcinoma showed similar effectiveness, with less impact on shoulder function (indirectly assessed by the Shoulder Pain and Disability Index) and with greater patients' satisfaction with appearance in the retroauricular group (RG) (8). Ji *et al.* evaluating the range of cervical spine and shoulder movement, through stratification obtained from measurements in degrees, found no differences in cervical and shoulder mobility between patients undergoing conventional or robotic dissection (9). They also concluded that robotic surgery was superior in terms of neck edema, changes in sensitivity and satisfaction with the cosmetic outcomes.

Although retroauricular neck dissection has been practiced for more than one decade, to date, however, no study has objectively compared the effect of retroauricular versus conventional approach on functional morbidity in unilateral neck dissection. An objective assessment of functional changes and QOL is essential for better exploration and understanding of the possible benefits and advantages of each technique.

The aim of the present study is to evaluate the functional morbidity and QOL of patients undergoing conventional and retroauricular (endoscopic or robotic) neck dissection. We present this article in accordance with the STROBE reporting checklist (available at https://gs.amegroups.com/article/view/10.21037/gs-23-471/rc).

Highlight box

Key findings

- The cervical spine range of motion (ROM) and trapezius muscle strength were better in patients undergoing retroauricular approach.
- Postoperative quality of life was worse in patients undergoing conventional neck dissection.

What is known and what is new?

- Patients undergoing retroauricular approach had lower incidence of postoperative complications and lower length of hospital stay.
- Retroauricular approach cause less functional impairment and better postoperative quality of life that conventional approach.

What is the implication, and what should change now?

- Retroauricular approach is a safe and effective in patients with head and neck cancer. Based on these results, it also appears to be an option with lower functional morbidity for these patients.
- Further prospective studies are needed.

Methods

Study patients

Thirty-five patients with head and neck cancer treated by the Department of Head and Neck Surgery and Otorhinolaryngology of the A.C. Camargo Cancer Center, São Paulo and by the Department of Head and Neck Surgery of the Cancer Institute of the State of São Paulo (ICESP), São Paulo, were enrolled in this case-control study between January 2018 and August 2023. Patients over 18 years of age, diagnosed with mucosal head and neck or thyroid cancer, who underwent unilateral neck dissection, regardless of the type, with conventional or retroauricular technique (endoscopic or robotic) were included. All patients included in the study signed the informed consent form. Patients were allocated to the conventional group (CG) and RG, respectively, according to the medical indication to perform the procedure via the conventional or endoscopic/robotic approach. The surgeons, belonging to the two cancer centers, were blind to the measurements evaluated in the patients.

Patients with a previous surgical approach to the neck or who underwent neoadjuvant treatment, and those with infection in the neck and/or face at the time of evaluation were excluded. Patients who presented recurrences or in the presence of comorbidities that contraindicated the performance of the tests used were also excluded. This work was approved by A.C. Camargo Cancer Center Research Ethics Committee (No. 2425/17) and by Cancer Institute of the State of São Paulo Ethics Committee (No. 3018/22). There should be no selection bias as the surgical approach was based on clinical indication and individual surgeon preference, not patient factors. The study was conducted in accordance with the Declaration of Helsinki (as revised in 2013).

Operative techniques

The traditional neck dissection by a transcervical curvilinear incision in the neck along a natural skin crease was performed according to established surgical procedures. In each of the three methods used, the dissection of lymphoadipose tissue from specific levels of the neck was performed while ensuring the preservation of important nerves including the marginal mandibular branch of the facial nerve, as well as the vagal, hypoglossal, lingual, spinal accessory, and phrenic nerves.

The retroauricular approach for neck dissections has been described by Yonsei Medical Center Head and Neck Department in Seoul (10). An incision is planned in the postauricular sulcus, curved around posteriorly and inferiorly and continued along hairline. The skin flap is then elevated subcutaneously in the postauricular area and continued anteriorly following the subplatysmal plain under direct vision using conventional instrumentation and a headlight, until all the targeted levels are exposed. Neck dissection in then initiated under direct visualization using conventional instruments at neck level II, exposing the accessory nerve. After this initial dissection, a self-retaining retractor is placed underneath the skin flap to maintain a working space without CO_2 gas insufflation, and endoscopic/robotic instrumentation is applied for dissection of levels I, II, III, IV, V, VI and VII, as needed. Three or four robotic arms including 30 degrees endoscope is inserted through this retroauricular approach. For endoscopic-assisted technique, besides the endoscope, laparoscopic instruments are used by the surgeon and assistant during the procedure. In both options, the enhanced visualization allows proper dissection of all ipsilateral neck levels. For lower neck levels (IV-V-VI-VII), the ergonomics of the endoscopic instrumentation can be quite challenging, therefore, robotic assistance is preferred for neck dissections that include these levels.

Functional outcomes and QOL evaluation

We evaluated the pain intensity, ROM of the cervical spine and shoulder and QOL preoperatively and on the 30th postoperative day (POD).

Pain was quantified by the visual analogue scale (VAS), in which 0 means total absence of pain and 10 the maximum level of pain bearable by the patient (11).

The ROM in degrees was measured by goniometric assessment of movements of the cervical spine (flexion, extension, cervical lateral flexion ipsilateral and contralateral to surgery and cervical rotation ipsilateral and contralateral to surgery) and shoulder (flexion, extension, abduction, internal rotation and external rotation ipsilateral and contralateral to the surgical incision) according to a protocol published by Marques (12). Trapezius muscle strength of their three portions (upper, middle, and lower trapezius) was measured by manual test (13) and the gradations of this test were as follows: (I) palpable contraction without movement; (II) minimal movement maintenance against gravity; (III) integral maintenance against gravity; (IV) integral maintenance against gravity and moderate

resistance; and (V) integral maintenance against gravity and vigorous resistance.

QOL was evaluated by application of the Brazilian Portuguese version of the University of Washington Quality of Life (UW-QoL) questionnaire, developed for the QOL assessment of patients with cancer of the head and neck. It comprises ten specific questions addressing relevant dimensions for the QOL assessment of patients with oral and oropharyngeal cancer: pain, appearance, activity, recreation, swallowing, chewing, speech, shoulder, taste, and saliva. A Likert-scale score allowed assigning ratings from 0 to 100 for each possible answer, with higher figures indicating improved QOL status (14). The two subscales "Physical Function" and "Socioemotional Function" proposed by Rogers *et al.*, due to its ability to increase response and accuracy (15). All evaluations were performed by the same examiner and the assessments of this study were not performed blindly.

Statistical analysis

Besides descriptive analysis, statistical comparison between the different surgical groups was computed using the Fisher's exact test for categorical variables and independent *t*-test or Mann-Whitney *U* for continuous variables. All statistical analyses were performed using SPSS version 29.0 (Chicago, IL, USA). A P value <0.05 was considered statistically significant.

Results

Anthropometric, oncological and surgical characteristics

The clinicopathological characteristics of the two groups are summarized in *Table 1*. The groups were similar for all baseline variables. The rate of postoperative complications was higher in the CG, expressed as bleeding (2 cases), sepsis (1 case), acute renal failure (1 case) and wound dehiscence (1 case) and none case with complications in the RG; however, without a statistically significant difference (P=0.11). The mean time of postoperative hospital stay was significantly shorter for the RG than for the CG 2 days (range, 1–6 days) *vs.* 5 days (range, 1–22 days), respectively; P=0.02.

Functional outcomes

The groups were similar in terms of preoperative pain scores. Preoperative pain in CG and RG was 1.8 (range, 0–8) and 1.3 (range, 0–6), respectively (P=0.30) and on the 30th POD, greater pain intensity was observed in CG 1.8 (range, 0–7) *vs.* 0.6 (range, 0–2) in RG (P=0.002).

The postoperative ROM of the cervical spine was smaller in the RG than in the CG for flexion (82.0±17.0 *vs.* 95.1±17.5, respectively; P<0.01) and greater in RG than CG for extension (115.0±28.5 *vs.* 80.0±26.7; P<0.001), ipsilateral lateral flexion (116.0±29.2 *vs.* 84.4±28.8; P<0.001), contralateral lateral flexion (107.0±30.2 *vs.* 79.6±31,5; P<0.001) and contralateral rotation (102±25.4 *vs.* 88.0±27.3; P=0.02), but not for ipsilateral rotation (106±21.3 *vs.* 98.3±28.7; P=0.28). No statistical differences were observed between the groups for shoulder ROM (*Table 2*). Trapezius muscle strength was similar between groups in the preoperative period. The three portions of the muscle (superior, medium and inferior) ipsilateral to the surgery showed higher strength scores in the RG on the 30th POD (P<0.05) (*Table 3*).

QOL

The QOL assessment showed that patients in the CG, compared to the RG, had worse UW-QoL scores for the domains "Chewing" (58.7±24.3 *vs.* 95.0±15.8; P<0.01), "Shoulder" (74.4±26.5 *vs.* 96.7±10.4; P<0.01) and in the composite "Physical Function" (74.9±21.4 *vs.* 88.2±7.2; P=0.01) (*Table 4*).

Discussion

In 2012, Koh and co-authors (10) of the Yonsei Medical Center Head and Neck Department in Seoul, South Korea, proved the safeness and feasibility of the robot-assisted retroauricular neck dissection. Few years later, the group of surgeons from the A.C. Camargo Cancer Center performed the first robotic retroauricular neck dissection in South America (16); since then, the procedure has been performed more frequently in some Brazilian oncological centers (2).

Postoperative morbidity is commonly assessed in studies comparing these two surgical modalities. Recent meta-analyses concluded that there were no differences in the incidence of postoperative complications (6,7,17) or length of hospital stay (6,17) between patients undergoing conventional or retroauricular surgery. In our analysis, although without statistical significance, no complications were observed in the RG and 20% of cases in the CG experienced complications These complications negatively

Table 1 Clinicopathological characteristics of the conventional and retroauricular neck dissection groups

Variables	Conventional group (n=25)	Retroauricular group (n=10)	P
Age (year)	55.2±12.3	52.2±13.6	0.67
Sex (male/female)	12/13	7/3	0.24
BMI (kg/m^2)	26.3±4.6	27.0±4.3	0.65
Tobacco consumption	11 [44]	3 [30]	0.34
Alcohol consumption	10 [40]	5 [50]	0.56
Comorbidities	12 [48]	4 [40]	0.85
Tumor side			0.78
Oropharynx	13 [52]	5 [50]	
Salivary glands	1 [4]	0	
Thyroid	11 [44]	5 [50]	
T classification			0.85
T1	13 [52]	6 [60]	
T2	7 [28]	3 [30]	
T3	4 [16]	1 [10]	
T4	1 [4]	0	
N classification			0.22
N0	10 [40]	1 [10]	
N1	10 [40]	5 [50]	
N2	5 [20]	4 [40]	
Type of neck dissection			0.84
Selective (levels I–III)	10 [40]	4 [40]	
Selective (levels II–IV)	2 [8]	1 [10]	
Selective (levels II–V)	9 [36]	4 [40]	
Modified radical (I–V)	4 [16]	1 [10]	
Operating time (min)	255 [100–840]	210 [120–450]	0.45
Postoperative complications	5 [20]	0	0.11
Postoperative hospital stay (d)	5 [1–22]	2 [1–6]	0.02
Postoperative physiotherapy	6 [24]	4 [40]	0.42

Data were presented as mean ± standard deviation, number, n [%], or median [range]. BMI, body mass index; T, tumor; N, node; min, minutes; d, days.

impact postoperative evolution, limiting patients' functionality and QOL. It is possible that the higher incidence of complications in CG may have influenced in the shorter length of hospital stay in the patients submitted to retroauricular approach, which is consistent with other publications (8,9,16).

Pain is a common finding and one of the most frequently reported symptoms in patients undergoing neck dissection, with up to 48% of operated patients present a pain intensity greater than 4 at VAS (18). In our sample, postoperative pain scores were higher in patients undergoing conventional surgery, which is consistent with the findings of other

Table 2 Cervical spine and shoulder range of motion of the conventional and retroauricular neck dissection groups

Movement tested	Conventional group (n=25)		Retroauricular group (n=10)		P
	Pre	30 POD	Pre	30 POD	
Cervical spine range of motion					
Flexion	100.0±0	95.1±17.5	100.0±0	82.0±17.0*	<0.01
Extension	100.0±0	80.0±26.7	100.0±0	115.0±28.5*	<0.001
Ipsilateral lateral flexion	100.0±0	84.4±28.8	100.0±0	116.0±29.2*	<0.001
Contralateral lateral flexion	100.0±0	79.6±31.5	100.0±0	107.0±30.2*	<0.001
Ipsilateral rotation	100.0±0	98.3±28.7	100.0±0	106±21.3	0.28
Contralateral rotation	100.0±0	88.0±27.3	100.0±0	102±25.4*	0.02
Shoulder range of motion					
Ipsilateral flexion	100.0±0	92.3±12.2	100.0±0	94.1±12.6	0.69
Contralateral flexion	100.0±0	99.1±5.9	100.0±0	96.1±11.5	0.32
Ipsilateral extension	100.0±0	97.8±16.8	100.0±0	92.7±10.4	0.38
Contralateral extension	100.0±0	99.5±10.7	100.0±0	98.5±7.7	0.79
Ipsilateral abduction	100.0±0	86,0±23,3	100.0±0	90.0±14.3	0.62
Contralateral abduction	100.0±0	98.4±17.3	100.0±0	90.1±13.1	0.19
Ipsilateral external rotation	100.0±0	89.3±17.1	100.0±0	96.9±18.7	0.25
Contralateral external rotation	100.0±0	98.7±13.0	100.0±0	105.0±13.1	0.23
Ipsilateral internal rotation	100.0±0	92.4±18.6	100.0±0	98.7±24,6	0.42
Contralateral internal rotation	100.0±0	98.4±17.3	100.0±0	100.0±18.9	0.77

Data were presented as mean ± standard deviation for continuous data. *, P<0.05 for intergroup comparison. POD, postoperative day.

Table 3 Trapezius muscle strength of the conventional and retroauricular neck dissection groups

Trapezius muscle portion	Period	Conventional group (n=25)	Retroauricular group (n=10)	P
Ipsilateral superior	Preoperative	5 [4–5]	5 [4–5]	0.41
	30 POD	4 [3–5]	5 [4–5]*	0.004
Contralateral superior	Preoperative	5 [4–5]	5 [4–5]	0.40
	30 POD	5 [4–5]	5 [5–5]	0.12
Ipsilateral medium	Preoperative	5 [4–5]	5 [4–5]	0.69
	30 POD	4 [3–5]	5 [4–5]*	0.01
Contralateral medium	Preoperative	5 [4–5]	5 [4–5]	0.59
	30 POD	5 [4–5]	5 [4–5]	0.30
Ipsilateral inferior	Preoperative	5 [4–5]	5 [4–5]	0.45
	30 POD	4 [3–5]	5 [4–5]*	0.03
Contralateral inferior	Preoperative	5 [4–5]	5 [4–5]	0.60
	30 POD	5 [4–5]	5 [5–5]	0.12

Data were presented as median [minimum–maximum value]. *, P<0.05 for intergroup comparison. POD, postoperative day.

Table 4 Quality of life assessment of the conventional and retroauricular neck dissection groups

UW-QOL domains	Conventional group (n=25)		Retroauricular group (n=10)		P
	Pre	30 POD	Pre	30 POD	
Pain	82.6±23.2	80.4±18.4	95.0±15.8	82.5±20.6	0.38
Appearance	92.4±14.0	70.7±20.9	95.0±10.5	72.5±14.2	0.40
Activity	89.1±22.4	75.0±27.2	95.0±10.5	77.5±14.2	0.39
Recreation	88.0±22.4	65.0±30.8	100.0±0	80.0±17.9	0.08
Swallowing	88.5±19.0	71.1±38.0	76.7±27.5	76.9±15.9	0.32
Chewing	80.4±32.8	58.7±24.3	95.0±15.8	95.0±15.8*	<0.01
Speech	95.7±11.4	76.9±30.9	90.0±31.6	80.2±17.2	0.37
Shoulder	95.7±15.3	74.4±26.5	100.0±0	96.7±10.4*	<0.01
Taste	97.1±14.0	72.9±38.5	93.3±21.2	90.1±15.9	0.09
Saliva	92.8±17.3	95.7±11.4	90.0±31.6	90.0±22.6	0.83
Mood	79.3±30.8	77.2±26.0	80.0±30.7	72.5±18.4	0.69
Anxiety	59.5±24.7	68.2±32.6	60.2±14.3	53.4±35.9	0.87
Social Function	81.8±14.5	72.8±15.2	87.5±10.4	73.1±14.3	0.48
Physical Function	91.7±10.1	74.9±21.4	90.8±13.3	88.2±7.2*	0.01

Data were presented as mean ± standard deviation for continuous data. *, P<0.05 for intergroup comparison. UW-QOL, University of Washington Quality of Life Questionnaire; POD, postoperative day.

authors (8,19). The presence of pain affects scapular biomechanics and shoulder ROM, accompanied by a worse QOL (20). An adequate management of postoperative pain is necessary, since pain improvement is associated increased upper limb strength and improved QOL (21).

The impairment of cervical spine and shoulder mobility is a significant functional impact after neck dissection (3). Even less extensive procedures that preserve the accessory spinal nerve can still result in muscle function damage, ranging from 5% to 36.9% depending on the type of neck dissection (21). Nerve injury is not the only factor that causes mobility restrictions in this population. Postoperative pain itself can worsen strength and ROM (22). Scar retraction during the healing process is also related to reduced ROM (23).

In our study, we found greater postoperative cervical ROM in patients undergoing surgery via the retroauricular approach. These results differ from those found by Ji *et al.*, who indirectly assessed the degree of functional impairment by measuring bilateral cervical rotation movement and assigning a score based on the angulation obtained (9).

No other studies that objectively evaluate the ROM of the cervical spine in a comparative manner in these populations. Although neck dissections have a direct impact on the functionality of the cervical spine, there is still a lack of substantial literature evaluating this impairment (3).

With regards to shoulder ROM, no differences were observed between the groups in the post-operative period. Lee *et al.* evaluated shoulder impairment 6 months after surgery by grading active abduction of the upper limb from 1 to 5, and found no differences between patients undergoing total thyroidectomy with conventional or robotic neck dissection (24). Ji *et al.* also found no significant differences in shoulder abduction movement between the groups throughout the postoperative period (9); the authors asked patients to perform the active shoulder abduction movement, and classified them according to range of movement into three subgroups. Yang *et al.* evaluated shoulder dysfunction in patients who underwent conventional or retroauricular neck dissection by applying the Constant-Murley Score (19). The authors compared patients 1 and 3 months after surgery and found less impact in patients undergoing retroauricular surgery.

The trapezius muscle is a key factor in functional changes resulting from head and neck surgery. From a biomechanical perspective, the upper fibers of the trapezius

muscle participate in the cervical extension movement, and unilaterally, they act in the lateroflexion and rotation movements of the cervical spine (13). Additionally, the trapezius has a postural function, helping to maintain the position of the scapula and assisting in the flexion and abduction movements of this joint (21). In the present study, patients who underwent retroauricular surgery achieved higher postoperative muscle strength scores in the three portions of the muscle ipsilateral to the surgery. Other authors (19) indirectly evaluated the function of this muscle in patients undergoing retroauricular and conventional surgery and concluded that patients undergoing robot procedure presents a higher score of postoperative strength.

QOL is a significant outcome that reflects an individual's satisfaction with their functional status, physical (or somatic) aspects, psychological and social relationships. In patients with neoplasia of the aerodigestive tract, the morbidity resulting from the disease and its treatment can affect important functions related to nutrition, communication, and social interaction of individuals (14). In our study, patients who underwent retroauricular approach showed higher postoperative scores of QOL in the Chewing and Shoulder domains, as well as in the Physical Function composite score. As treatment sequelae can cause temporary or permanent impairments of oral cavity functions and anatomy such as mastication, swallowing, dentition, muscles and nerves (25). Difficulties in chewing and swallowing compromise oral intake, leading to significant weight loss and malnutrition and, consequently, to longer hospital stays and greater morbidity, mortality and healthcare costs (26). UW-QoL shoulder domain the shoulder domain is capable of detecting shoulder dysfunction in patients with head and neck cancer (21,27). Difficulties with dressing, writing, driving, lifting light objects, and reaching for things can have a serious effect on social activities, recreation, and work, significantly affecting QOL (27). Our results differ from those obtained by Lee *et al.*, in which no differences were detected in the assessment of QOL between the group of patients undergoing robotic or conventional surgery, using the Voice Handicap Index (VHI-10) and Neck Dissection Impairment Index (NDII) as instruments, 6 months after the procedure (24). Conversely, Yang *et al.* found higher QOL scores in patients undergoing retroauricular neck dissection compared to those undergoing conventional surgery in the first and third months after surgery (19).

The main limitation of this study is the small sample size, which prevented the allocation of patients into subgroups based on the primary site and lymph node levels resected, as well as it was not possible to evaluate the impact of possible confounding factors such as the primary site, stage of the disease, anthropometric factors and presence of systemic diseases on postoperative functional evolution. However, to the best of our knowledge, this study is the first in the literature to objectively compare cervical spine and shoulder ROM and trapezius muscle strength between conventional and retroauricular neck dissection. Therefore, it is challenging to compare our results with other studies, highlighting the necessity for large prospective studies that assess functional aspects and QOL in these patients with a longer follow-up period.

Conclusions

Retroauricular neck dissection was found to be superior to conventional access surgery in several significant functional outcomes, including post-operative pain intensity, cervical spine ROM, trapezius muscle strength, and QOL. However, no difference in shoulder ROM was detected between the studied groups. Larger prospective series are necessary to confirm and better understand the functional advantages of endoscopic and robotic neck dissection using the retroauricular approach.

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Footnote

Reporting Checklist: The authors have completed the STROBE reporting checklist. Available at https://gs.amegroups.com/article/view/10.21037/gs-23-471/rc

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Ethical Statement: The authors are accountable for all

aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. The study was conducted in accordance with the Declaration of Helsinki (as revised in 2013). This work was approved by A.C. Camargo Cancer Center Research Ethics Committee (No. 2425/17) and by Cancer Institute of the State of São Paulo Ethics Committee (No. 3018/22). All patients included in the study signed the informed consent form.

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