Original article

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PROGNOSTIC FACTORS FOR LOCOREGIONAL RECURRENCES AFTER SUPRACRICOID LARYNGECTOMY

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Supracricoid laryngectomy, also named open partial horizontal laryngectomy type II (OPH II), involves resection of the ventricular folds, vocal folds, paraglottic space, thyroid cartilage, optionally up to one arytenoid cartilage, and, depending on whether it is an OPH II A or B, of the epiglottis. Locoregional control of the disease is a complex phenomenon that includes the characteristics of the tumor, the patient and genetic factors. This study aimed to identify factors indicating an increased possibility of locoregional recurrences following supracricoid laryngectomy.

Retrospective study included 104 patients who underwent supracricoid laryngectomy at the Otorhinolaryngology and Head and Neck Surgery Clinic of the University Clinical Center of Vojvodina in the period 2002–2020. Pathohistologically verified TN stage, thyroid cartilage invasion, positive margins, vascular invasion, positive Delphi lymph node and extranodal extension of metastatic disease were estimated as predictive factors for locoregional recurrences.

The median time for a local recurrence was 22 months (9.5–59.5), and the median time for regional recurrence was 21 months (10–38.5). Statistical significance in local recurrences of the disease was recorded in the presence of pathohistologically confirmed positive margins ($p = 0.033$) and vascular invasion ($p = 0.029$). The statistical significance of vascular invasion was also observed in regional ($p = 0.041$) and locoregional recurrences ($p = 0.004$). Pathohistologically confirmed higher T stage showed statistical significance in the occurrence of regional metastases ($p = 0.035$).

Pathohistologically confirmed vascular invasion stands out as an independent factor that should be paid attention to in further postoperative therapeutic care in order to achieve high-quality locoregional control of the disease, while in local control, along with vascular invasion, the importance of positive resection margins is also emphasized.

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Key words: *laryngeal carcinoma, organ preservative protocol, open partial horizontal laryngectomy type II, supracricoid laryngectomy*

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Introduction

Laryngeal carcinoma is one of the most common head and neck carcinomas accounting for about 1% of all cancer cases and cancer-related deaths (1). The incidence and mortality of laryngeal carcinoma in 2020 were estimated at 184,615 newly diagnosed cases and 99,840 deaths (2). With the reduction in tobacco use, the incidence of laryngeal carcinoma has decreased by 2.4% each year over the last 10 years (3). The 5-year survival rate of patients with laryngeal carcinomas is estimated at 80% to 90% for early-stage, T1 and T2 tumors (1, 3). In contrast, survival decreases to 40% in patients diagnosed with stage IV disease (3).

Open partial horizontal laryngectomy type II (OPH II), in literature also named supracricoid partial laryngectomy with cricohyoidopexy, was first introduced as an alternative to total laryngectomy for the treatment of selected cases of glottic and supraglottic carcinomas by Mayer in 1959, while in 1974, Piquet described cricohyoidepiglottopexy as a modification of the previously mentioned procedure in the case of glottic carcinoma. This type of partial laryngectomy involves resection of the ventricular

folds, vocal folds, paraglottic space, thyroid cartilage, optionally up to one arytenoid cartilage, and, depending on whether it is a subgroup of OPH II A or B of the epiglottis (resection of the epiglottis present in the case of OPH II B) (4). Preservation of at least one cricoarytenoid unit is crucial for functional recovery after surgery (5). Retrospectively analyzed results of this method showed excellent oncological and functional success in the treatment of glottic and supraglottic carcinomas (6). The main advantage of such a surgical procedure compared to total laryngectomy is reflected in the preserved ability of speech created by bringing air from the lungs, avoiding transient or permanent swallowing disorders as well as permanent tracheostomy, with the presence of very good local control of the disease (4). It is believed that the excellent results of the organ preservation protocol, including OPH II, will be maintained if the indications for its application are strictly followed (7). Traditional guidelines for performing OPH type II in glottic carcinomas include T1a and T1b carcinoma with radiologically suspicious invasion of the l cartilage, T2 carcinoma, T3 carcinoma of the glottis without cancerous invasion of the cricoarytenoid joint but with possible invasion of the anterior commissure and preepiglottic space, as well as carefully selected patients with stage T4 tumors with limited cartilage involvement and extralaryngeal spread in the anterior compartment. OPH II is indicated for T2 supraglottic carcinomas in which supraglottic laryngectomy is contraindicated due to invasion of the floor of the ventricle, extension to the glottis and/or reduced vocal cord mobility, as well as for T3 supraglottic carcinomas involving the preepiglottic space (6, 8, 9). Determining the stage of laryngeal cancer has long been considered a criterion that correlates well with locoregional control of the disease and overall survival, however prognosis is a complex phenomenon that also includes characteristics of the tumor, the patient and genetic factors. Prognosis is further complicated by the fact that negative prognostic factors have not been universally determined, although defining them would greatly facilitate the choice of therapeutic modality (10).

This study aimed to identify factors that might indicate an increased possibility of both local and regional recurrences of laryngeal carcinoma in patients treated with OPH II.

Materials and Methods

This retrospective study included 104 patients who underwent open partial horizontal laryngectomy type II as part of laryngeal cancer treatment at the Otorhinolaryngology and Head and Neck Surgery Clinic of the University Clinical Center of Vojvodina between 2002 and 2020. Of 104 patients, 86 (83%) patients were male, while 18 (17%) were female. The average age of patients at the time of operative treatment was 60 years (ranging from 56 to 67 years). Patients who, in addition to laryngeal carcinoma, had one or more primary localizations of cancer in the head and neck region, as well as patients who had previously been surgically treated for laryngeal carcinoma, were excluded from the study.

After the pathohistological verification of laryngeal carcinoma, all patients were presented at the Oncology Council for Malignancies of the Head and Neck Region of the University Clinical Center of Vojvodina where a decision was made regarding the patient`s surgical management. As part of preoperative assessment, patients underwent contrast-enhanced computer tomography (CT scan) of the head, neck and chest as well as abdominal ultrasound. Before the procedure, each patient was counseled about the planned course of the procedure, potential complications, and the expected postoperative recovery. After the induction of general endotracheal anesthesia, a direct laryngomicroscopy was performed on each patient to gain a better insight into the size and extent of the laryngeal involvement by the tumor. OPH II A was performed in 93 cases, which involved cricohyoidepiglottopexy as part of the neolarynx reconstruction, while OPH II B was performed in 29 patients, which meant cricohyoidopexy as part of reconstruction. Neck dissections were done as diagnostic procedure in 87 patients, and as a therapeutic procedure in 17 patients, in the same acts as OPH II. After the operative treatment, and upon the arrival of the definitive postoperative pathohistological findings, the patients were diagnosed with pathological tumor-node-metastasis (pTNM), and then they were again presented at the Oncology Council for Malignancies of the Head and Neck Region of the University Clinical Center of Vojvodina, where a decision was made to administer adjuvant therapy, which was applied to 20 patients (radiotherapy to 18 patients (17%), chemotherapy to 1 patient (1.0%), and chemoradiotherapy to 1 patient (1.0%)). In the following period, the patients were regularly controlled and monitored by the operator according to the protocol for monitoring patients after surgical treatment of malignancy in the head and neck region. Patients in whom the existence of local or regional recurrence was suspected by clinical examination underwent a CT scan of the head and neck region, on which the existence of recurrence was radiologically verified. After radiological verification of local recurrence, the patients were again presented to the Oncology Council for Malignancies of the Head and Neck Region of the University Clinical Center of Vojvodina, where a decision was made to treat the recurrence of laryngeal malignancy in the form of a conservative approach (radiotherapy, chemoradiotherapy, chemotherapy, symptomatic therapy) or surgical approach (total laryngectomy in case of local recurrence, or modified radical, radical neck dissection or extirpation of a metastatic lymph node).

In order to determine predictive factors for local and regional recurrences after OPH II, the pathohistologically verified TN stage of each patient was taken into account. In addition, the pathohistological parameters obtained after surgical treatment (invasion of the thyroid cartilage, positive resection margins, vascular invasion, positive Delphian lymph node, and extranodal spread of metastatic disease) were considered. Recurrence, both local and regional, was defined as any occurrence of carcinoma at the same localization in the case of local recurrence, or regional occurrence of metastatic disease within 5 years of surgical treatment.

Statistical analyzes were performed using RStudio 2024.04.2 + 764 "Chocolate Cosmos" version. The normality of continuous variables was assessed using the Kolmogorov–Smirnov test. Continuous variables were compared between independent groups using the Wilcoxon rank sum test. Categorical variables were compared using the Chi-square test or Fisher's exact test, as appropriate. Cox proportional hazards modeling was used to examine associations between the outcome and predictor variables. Hazard ratios (HRs) and their 95% confidence intervals (CIs) were used to qualify the magnitude and direction of associations. Kaplan–Maier curves were plotted to visualize survival probabilities, stratified by relevant variables. All statistical tests were two-tailed, and an alpha level of 0.005 was set as the significance threshold. No imputation was used for missing data.

This study was approved by the Ethics Committee of the Clinical Center of Vojvodina, approval number 00-365, approval date: October 15, 2024.

Results

A total of 104 patients participated in this retrospective study (86 men (83%) and 18 women (17%)), with previously histologically verified laryngeal carcinoma, who underwent OPH II as part of the treatment. The average age of the patients was 60 years (range 56 to 67 years). OPH II A was performed in 78 cases (75%), while OPH II B was performed in 26 patients (25%).

In 92 patients (88%), the primary site of the tumor was the glottis, while in the remaining 12 patients (12%), supraglottic carcinoma was surgically treated as the primary origin. Over half of the patients at the time of treatment had T2 stage (54 patients; 52%), while the following were slightly less represented: T3 (30 patients; 29%), T1b (17 patients; 16%), T4a (2 patients; 1.9%) and finally T1a (1 patient; 1.0%). The largest number of patients at the time of operative treatment was in the N0 stage (87 patients; 84%), then N1 (5 patients; 4.8%), while the other groups were equally represented (N2b, N2c, N3b stages—3 patients; 2.9% in each of four groups) (Table 1). All patients were in M0 stage at the time of surgery (104 patients; 100%).

After obtaining definitive pathohistological findings, it was observed that 24 patients (23%) had verified cartilage invasion. Vascular invasion was experienced by 9 patients (8.7%), while perineural invasion was experienced by 10 patients (9.6%). Positive margins were present in 5 patients (4.8%). The Delphian node was affected by metastatic disease in 6 patients (5.8%), while extranodal spread of metastatic disease (extranodal extension (ENE) at the time of surgical treatment) was present in 3 patients (2.9%) (Table 2).

After OPH II, 84 patients (81%) did not receive adjuvant therapy, while 20 patients (19%) received adjuvant therapy, namely, 18 patients (17%) received radiotherapy, while polychemotherapy and chemoradiotherapy were administered to 1 patient each (1.0%).

The average patient follow-up time, the period of time during which the patients regularly came for scheduled check-ups, was 59 months (range from 29 to 100 months).

Of the 104 patients who underwent surgery and were retrospectively reviewed, 86 patients (83%) experienced no local or regional recurrences. The number of patients with local recurrences was 9 (8.7%), while the number of patients with regional recurrences was 15 (14.42%). Only 3 patients (2.5%) had isolated local recurrence of laryngeal cancer, isolated regional recurrence was observed in 9 patients (8.7%), while local and regional recurrences occurred simultaneously in 6 patients (5.8%) (Table 3).

Table 1. Pathohistologically confirmed TN stage of patients at the time of surgery

T stage	***N (%)***
T1a	1 (1.0%)
T1b	17 (16%)
T2	54 (52%)
T3	30 (29%)
T4a	2 (1.9%)
N stage	***N (%)***
N0	87 (84%)
N1	5 (4.8%)
N2a	3 (2.9%)
N2b	3 (2.9%)
N2c	3 (2.9%)
N3b	3 (2.9%)

Table 2. Findings of pathohistological analyses

Cartilage invasion	***N (%)***
Yes	24 (23%)
No	80 (77%)
Vascular invasion	***N (%)***
Yes	9 (8.7%)
No	95 (91.3%)
Perineural invasion	***N (%)***
Yes	10 (9.6%)
No	94 (90.4%)
Positive margins	***N (%)***
Yes	5 (4.8%)
No	99 (95.2%)
Metastasis in Delphian lymph node	***N (%)***
Yes	6 (5.8%)
No	98 (94.2%)
ENE	***N (%)***
Yes	3 (2.9%)
No	101 (97.1%)

Table 3. Local and regional recurrences after OPH II

Cancer recurrence	***N (%)***
No	86 (83%)
Local	3 (2.5%)
Regional	9 (8.7%)
Local + Regional	6 (5.8%)

The median time for local recurrence was 22 months (9.5–59.5) (Figure 1), while the median for regional recurrence was 21 months (10–38.5) (Figure 2).

Regarding the pathohistologically confirmed T stage of laryngeal carcinoma at the time of surgical treatment, statistical significance was observed in predicting regional recurrences (p = 0.035), but no statistical significance was observed in local recurrences (p = 0.18). Although without statistical significance in terms of local recurrences, a higher frequency of recurrences was observed in laryngeal carcinomas treated with OPH II, which at the time of treatment had pathohistologically confirmed T4a stage disease (50%) (Table 4).

When it comes to pathohistologically confirmed N stages of metastatic disease of laryngeal carcinoma at the time of surgical treatment, no statistical significance was observed in both local recurrences (p = 0.71) and regional recurrences (p = 0.36). Although without statistical significance, a higher percentage of regional recurrences can still be observed in patients who, at the time of OPH II, had pathohistologically confirmed N3b stage (67%) (Table 5).

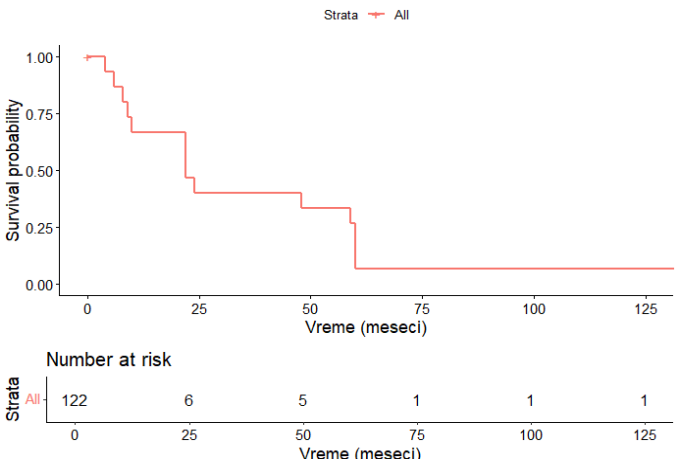

Figure 1. Kaplain–Maier risk curve of local recurrence

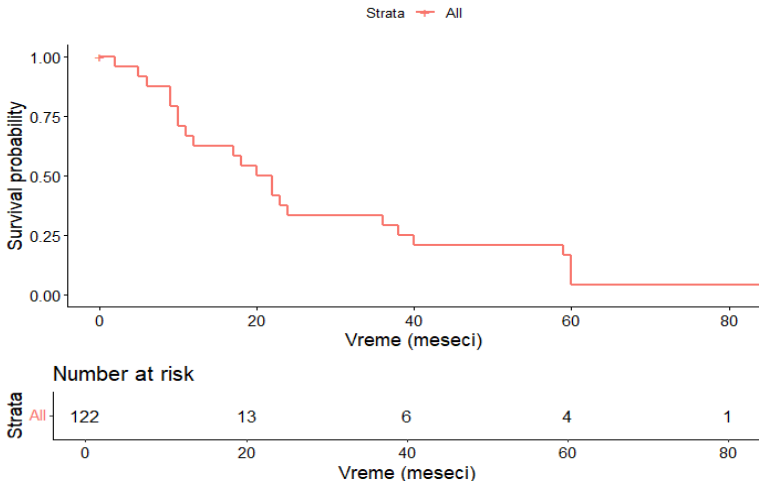

Figure 2. Kaplain–Maier risk curve of regional recurrence

Table 4. Local and regional recurrences in relation to pathohistologically confirmed T stage of laryngeal carcinoma at the time of surgical treatment

	T1a	***T1b***	***T2***	***T3***	***T4a***	**p**
	N = 1	N = 18	N = 60	N = 39	N = 4	
Local recurrence N (%)						0.18
No	1 (100%)	17 (100%)	48 (89%)	28 (93.3%)	1 (50%)	
Yes	0 (0%)	0 (0%)	6 (11%)	2 (6.7%)	1 (50%)	
Regional recurrence N (%)						***0.035***
No	1 (100%)	17 (100%)	42 (78%)	28 (93.3%)	1 (50%)	
Yes	0 (0%)	0 (0%)	12 (22%)	2 (6.7%)	1 (50%)	

Table 5. Local and regional recurrences in relation to pathohistologically confirmed N stage of metastatic disease of laryngeal carcinoma at the time of surgical treatment

	N0	***N1***	***N2a***	***N2b***	***N2c***	***N3b***	**p**
	N = 102	N = 5	N = 3	N = 4	N = 4	N = 4	
Local recurrence N (%)							0.71
No	79 (90.8%)	5 (100%)	3 (100%)	3 (100%)	2 (67%)	3 (100%)	
Yes	8 (9.2%)	0 (0%)	0 (0%)	0 (0%)	1 (33%)	0 (0%)	
Regional recurrence N (%)							0.36
No	75 (86%)	5 (100%)	2 (67%)	3 (100%)	2 (67%)	2 (67%)	
Yes	12 (14%)	0 (0%)	1 (33%)	0 (0%)	1 (33%)	1 (33%)	

Statistical significance in local recurrences of the disease was recorded in the presence of pathohistologically confirmed positive resection margins (p = 0.033), as well as vascular invasion (p = 0.029) (Figure 3).

Statistical significance in regional recurrences was observed in vascular invasion (p = 0.041). Although without proven statistical significance in the Forest plot for the COX proportional hazard model with a confidence interval of 95%, the presence of ENE can indicate an overall greater possibility of regional recurrences of laryngeal cancer (Figure 4).

Locoregional recurrences were associated with a significantly higher frequency of

pathohistologically confirmed vascular invasion (p = 0.004) (Figure 5).

Surgical management of local recurrences included total laryngectomy (6 patients; 67%) and pharyngolaryngectomy (1 patient; 16.5%) (Table 6).

In most cases of regional recurrences (40%), conservative therapy (chemotherapy, radiotherapy, chemoradiotherapy or symptomatic therapy) was applied. Surgical management of regional recurrences in the same number of cases included radical dissection (3 patients; 20%) and selective dissection (3 patients; 20%), then modified radical dissection (2 patients; 13.3%) and finally node extirpation (1 patient; 6.7 %) (Table 7).

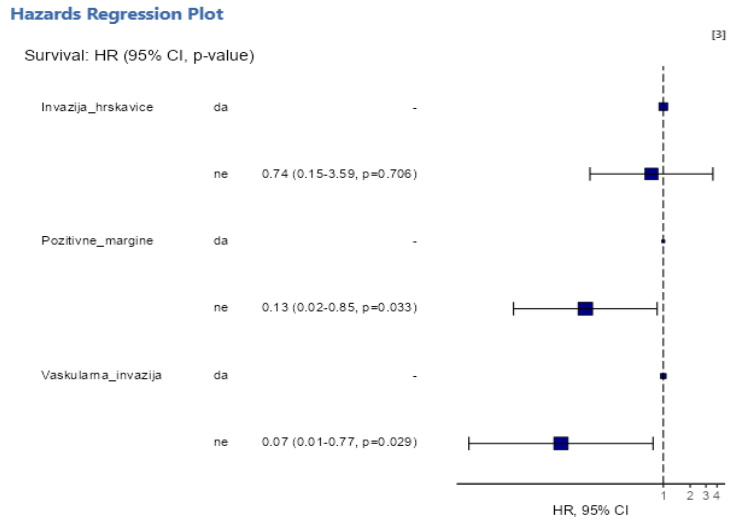

Figure 3. Forest plot of multivariate COX analysis of risk of local recurrence

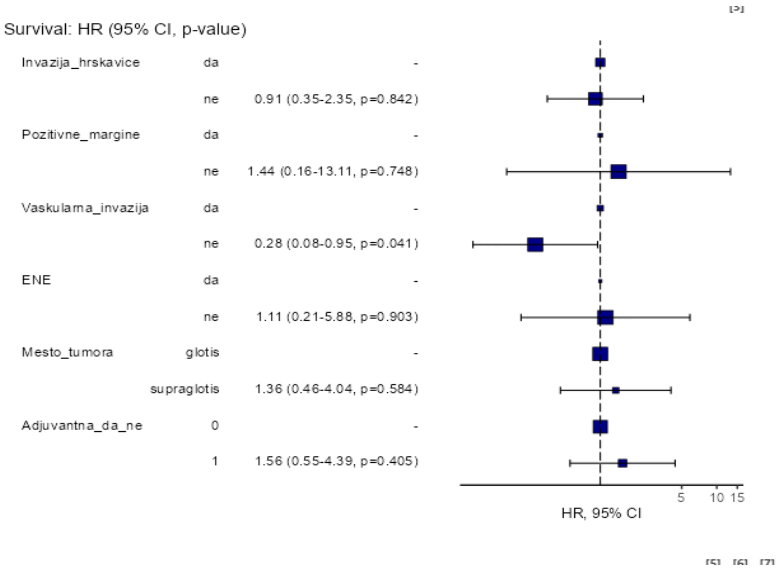

Figure 4. Forest plot of multivariate COX analysis of risk of regional recurrence

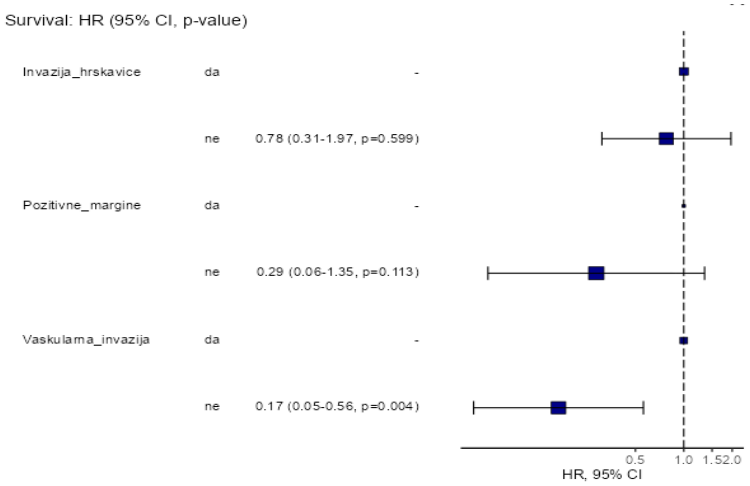

Figure 5. Forest plot of the multivariate COX analysis of the risk of simultaneous local and regional recurrence

Table 6. Surgical management of local recurrences of laryngeal carcinomas

Surgical management	***N (%)***
Without surgery	1 (16.5%)
Total laryngectomy	6 (67%)
Pharyngolaryngectomy	1 (16.5%)

Table 7. Surgical treatment of regional recurrences of laryngeal carcinomas

Surgical management	***N (%)***
Without surgery	6 (40%)
Extirpation of the metastatic lymph node	1 (6.7%)
Selective neck dissection	3 (20%)
Radical neck dissection	3 (20%)
Modified radical neck dissection	2 (13.3%)

Discussion

In 70% of cases, laryngeal carcinomas originate in the glottis, then the supraglottis and finally the subglottis, and squamous cell carcinoma is the main histological type of laryngeal malignancies. The National Comprehensive Cancer Network (NCCN) has developed clinical practice guidelines for the screening, prevention, diagnosis, treatment, and follow-up of patients with various types and locations of cancer, including cancers of the head and neck region (2). Historically, the main therapeutic modality for patients with advanced laryngeal carcinoma has been total laryngectomy, which is associated with functional deficits and was often followed by poor survival if not by adjuvant therapy. The treatment strategy for T1/T2 cancer of the larynx involves an organ preservation protocol, either surgical or conservative, emphasizing the importance of adequate patient selection. The spread of the disease, adequate visualization and comorbidities must be taken into account when choosing the treatment modality (11). As a possible source of confusion, the large heterogeneity within the T3 and T4a groups of tumors can be mentioned (T3 minimal vs. massive involvement of the paraglottic space, with or without cartilage invasion, with or without involvement of the preepiglottic space, different levels of reduced mobility of the vocal cords; T4a anterior extralaryngeal expansion vs. postero-inferior extension through the lateral part of the cricothyroid membrane and the cricothyroid space). The level of diagnostic confusion has been reduced by endoscopic and radiological visualization of laryngeal carcinoma, but none of these methods has yet established a definitive way to determine the cause of vocal cord fixation (7). Currently, multiple surgical and nonsurgical organ-preserving options are available for the treatment of T3 and T4a cancers that are competitive in terms of locoregional control, overall survival, and survival without the need for total laryngectomy. Multiple studies with a large number of patients as one of the options of an organ preservation protocol with a high rate of locoregional control, overall survival, and better functional results compared to total laryngectomy have highlighted OPH (7). In a multicentric study conducted in Italy, it was observed that the overall five-year survival after OPH II was 87.92% and the five-year survival without signs of the disease was 81.87%, which in itself indicates its success (5). OPH II has been highlighted as a type of

laryngectomy with relatively low morbidity, good overall survival, better oncological control than OPH III and long survival without the need for total laryngectomy (7, 12, 13). A systematic review of several studies conducted in the USA indicated that the percentage of local recurrences after a supracricoid laryngectomy in a five-year period was 1.85% (9). Low percentages of local recurrences in the same period of 2.5% were also observed in our study. In our study, locoregional control was achieved in 83% of patients, and 5.77% of all treated patients required total laryngectomy. Only 1 patient (0.96%) underwent pharyngolaryngectomy as part of the surgical management of local recurrences of laryngeal carcinomas, confirming previous claims. If only patients with present local disease were considered, 67% were candidates for total laryngectomy, 16.5% for pharyngolaryngectomy, thus leaving 83.5% of these patients manageable at the time of local recurrence of the disease. The same frequency in the surgical management of regional recurrences was equally distributed between radical and selective neck dissection (20% each). However, the majority of patients with regional recurrences (40%) were not candidates for surgical treatment.

In a multicentric study conducted across several centers in Italy, it was noted that, in case of relapse, the highest percentage involved local relapses, followed by regional and then locoregional with rates of 40%, 25% and 5.7% of patients experiencing relapses, respectively (7). A somewhat different trend was observed in the present study, where the highest percentage was represented by regional recurrences (8.7%), then locoregional (5.8%), and finally local (2.5%). Such a discrepancy between the results can be interpreted as a discrepancy between the pTN patients who participated in the study. While the previously mentioned study included only patients with pT3 and pT4a laryngeal carcinomas, in the current study, only 30.9% of all surgically treated patients were in these two stages. This can actually lead to a conclusion about the importance of the pT stage in the development of local recurrences.

In a multicentric study conducted in two centers in Italy, the results indicate that only pathohistologically confirmed vascular invasion ($p = 0.001$) affects overall survival, while disease-free period was influenced by pT ($p = 0.0001$), pN stage ($p = 0.083$) and vascular invasion ($p = 0.006$). Based on this, perivascular invasion was defined as an independent prognostic factor associated with lower overall survival and disease-free period (5). In our study, vascular invasion proved to be a statistically significant factor in local recurrences ($p = 0.029$), regional recurrences ($p = 0.041$), as well as locoregional recurrences ($p = 0.004$). Pathohistologically confirmed vascular invasion, the only factor that appeared in all three groups of recurrence, is a very strong predictive factor for recurrence. By correlating these results with the results of the previously mentioned study, we underline the importance of this factor in the predictive model of recurrence and in taking it into account when deciding on the application of adjuvant therapy. In addition to vascular invasion, concerning local recurrences, the statistically significant factor in the current study was positive resection margins ($p = 0.033$). Positive margins stood out as an important factor for predicting locoregional recurrences in a study conducted at the University Hospital of Santa Lucia, where it was observed that disease recurrence was present in 22.5% of patients with positive margins, as opposed to 6.1% of patients who did not have positive margins (14). In this study, statistical significance was observed in pT stage and regional recurrences ($p = 0.035$). Statistical significance in local recurrences was not recorded, however, it can be noted that in the pT4a stage, recurrences were present in 50% of cases, which highlights the importance of this factor in the case of local disease control. The absence of statistical significance regarding the pN stage in the prediction of both regional and locoregional recurrences can be explained by the great heterogeneity between the groups, which is the origin of the indications when performing surgery. It is noted that the majority of patients with OPH II were treated in the pN0 stage (84%), while only 2.9% of patients were treated in the pN3b stage. Similar results regarding the importance of vascular invasion and positive margins ($p < 0.001$) were published in a study that subsumed the results from two centers in Italy—Rome and Milan. Also, like the previously mentioned study, this one highlights the importance of pN status in predicting recurrence (15).

In a multicentric study conducted at two centers in Italy, loco-regional recurrences occurred 23.5 ± 14.8 SD months after OPH II (5). In the current study, the median time to local recurrence was 22 months (9.5–59.5), while the median time to regional recurrence was 21 months (10–38.5). These results particularly emphasize the importance of regular monitoring of the patient, especially in the first two to three postoperative years, considering the highest likelihood of recurrence during that period.

Conclusion

With proper consideration of factors related to the patient and tumor, adequate locoregional control of patients treated with an organ preservation protocol is achieved. Patho-histologically confirmed vascular invasion emerges as an independent factor that warrants close attention in postoperative management to achieve optimal locoregional disease control, while in local control, along with vascular invasion, the importance of positive resection margins is also emphasized.

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PROGNOSTIČKI FAKTORI LOKOREGIONALNIH RECIDIVA NAKON SUPRAKRIKOIDNE LARINGEKTOMIJE

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Suprakrikoidna laringektomija, koja se imenuje i kao otvorena parcijalna horizontalna laringektomija tip II (OPH II), podrazumeva resekciju ventrikularnih nabora, glasnica, paraglotisnog prostora, tireoidne hrskavice (opciono jedne aritenoidne hrskavice) i, u zavisnosti od toga da li je reč o podgrupi OPH II A ili B, epiglotisa. Lokoregionalna kontrola bolesti predstavlja kompleksan fenomen koji obuhvata karakteristike tumora, pacijenta i genetske faktore. Cilj ove studije bila je identifikacija faktora koji mogu ukazati na povećanu mogućnost pojave lokoregionalnih recidiva posle suprakrikoidne laringektomije.

Ova retrospektivna studija obuhvatila je sto četiri pacijenta lečena na Klinici za otorinolaringologiju i hirurgiju glave i vrata Univerzitetskog kliničkog centra Vojvodine između 2002. i 2020. godine koja su bila podvrgnuta suprakrikoidnoj laringektomiji. Kao prediktivni faktori za pojavu lokoregionalnih recidiva tumora u obzir su uzeti patohistološki verifikovan TN stadijum, invazija tireoidne hrskavice, pozitivne margine, vaskularna invazija, pozitivan delfski limfni čvor i ekstranodalna propagacija metastatske bolesti.

Medijana vremena pojave lokalnog recidiva iznosila je dvadeset dva meseca (9,5–59,5), a medijana pojave regionalnog recidiva dvadeset i jedan mesec (10–38,5). Statistička značajnost u pojavi lokalnih recidiva bolesti zabeležena je u vezi sa prisustvom patohistološki potvrđenih pozitivnih margina ($p = 0,033$) i vaskularnom invazijom karcinoma ($p = 0,029$). Statistička značajnost vaskularne invazije zapažena je i u pojavi regionalnih ($p = 0,041$) i lokoregionalnih recidiva ($p = 0,004$). Patohistološki potvrđen T stadijum pokazao je statističku značajnost u pojavi regionalnih metastaza ($p = 0,035$).

Patohistološki potvrđena vaskularna invazija izdvaja se kao nezavisan faktor na koji treba obratiti pažnju u terapijskom zbrinjavanju posle operacije radi postizanja kvalitetne lokoregionalne kontrole bolesti. U lokalnoj kontroli se uz vaskularnu invaziju ističe i važnost pozitivnih margina resekata.

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***Ključne reči**: laringealni karcinomi, protokol usmeren na očuvanje organa, otvorena parcijalna horizontalna laringektomija tip II, suprakrikoidna laringektomija*