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Review Article

Postoperative Care in Oropharyngeal Cancer

Pop S*
ENT Department, University of Medicine and Pharmacy Cluj-Napoca, Romania

***Corresponding author:** Pop S, ENT Department, University of Medicine and Pharmacy, Clinicilor street 4-6, 400431 Cluj-Napoca, Romania

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Abstract

Oropharyngeal squamous cell carcinoma (OPSCC) accounts for 10–15% of all head and neck malignancies. Smoking and alcohol abuse are the most significant associated etiological risk factors. Recent studies demonstrate strong correlation between OPSCC and human papillomavirus infection. Treatment options include surgery and organ-preserving approaches such as radiotherapy and chemotherapy.

This review focuses on the main issues that follow the curative surgical treatment of OPSCC: management of complications, evaluation of functional outcomes, and management of recurrent and persistent disease.

Keywords: Oropharyngeal cancer; Surgery; Postoperative care

Abbreviations

OPSCC: Oropharyngeal Squamous Cell Carcinoma; HPV: Human Papillomavirus; TLM: Transoral Laser Microsurgery; LSM: Lip-Split Mandibulotomy

Introduction

Oropharyngeal squamous cell carcinoma (OPSCC) accounts for 10–15% of all head and neck cancers and 0.3–0.5% of all reported malignancies [1]. The most important associated etiological factors are smoking and alcohol abuse, the effects of which are cumulative [1]. Dietary deficiencies of vitamin A, poor dental hygiene, chronic irritants, and marijuana smoking are also considered to be predisposing factors [2]. Recently, enhanced expression of human papillomavirus types 2,11, and 16 has been reported, mainly in patients with tonsillar carcinoma [3,4]. Evidence suggests that HPV-associated OPSCC shows both an increased incidence and a better prognosis [5]. Treatment options include surgery and organ-preserving approaches such as radiotherapy and chemotherapy [1].

Surgical Treatment of OPSCC: Principles of Postoperative Care

Most oropharyngeal tumors are operable, but whether they are curable by surgery alone is controversial. The basic surgical principle is that resection must include a margin of 1–2 cm of healthy tissue. Frozen section may be used to ensure an appropriate excision [6]. The surgical procedure must be completed with the management of the neck.

Oropharyngeal cancers can be resected using the following surgical approaches:

- Transoral: CO_2 Laser Microsurgery (TLM) [7], transoral robotic surgery [8]
- Transoral/transcervical combined: "pull-through" technique [9]
- Transpharyngeal: suprahyoid pharyngotomy [10], lateral pharyngotomy
- Transmandibular: mandibulotomy, mandibulectomy [11]

The approach chosen depends on the size and location of the tumor, whether an associated neck dissection is being planned, and the method of reconstruction [12]. Transoral approaches have become more common, mainly due to their better functional outcomes [7,8,9].

Advances in the quality of reconstruction of major surgical defects have progressed over the last several decades. Various procedures are available, ranging from primary closure and healing by secondary intention for smaller defects, to the use of local, myocutaneous, and free microvascular tissue transfer flaps [13]. The effect of radiotherapy on reconstructive flaps has also been assessed, suggesting that radiotherapy is better delivered after surgery [14].

At the end of the surgical procedure, hemostasis should be carefully assessed and the airway should be endoscopically evaluated to determine whether extubation is safe. Patients undergoing transoral surgery for oropharyngeal cancer rarely require an alternate airway. However if there is concern, a tracheostomy can be performed, or extubation can be postponed until airway edema resolves [15]. Williams et al. report a 29% tracheostomy rate for TLM, compared with a 100% rate for lip-split mandibulotomy [16]. Mean decannulation time was 5 days in the TLM group, compared with 7 days in the LSM group. Henstrom et al. report a mean decannulation time of 6 days after TLM of tumors of the base of the tongue [17]. In cases of TLM of tonsillar carcinoma, Holsinger et al. report an average time to decannulation of 5 days [18]. Studies of transoral robotic surgery report temporary tracheostomy rates from 0 to 31% [19, 20]. However, the majority of these patients were decannulated within the first 2 weeks. At 1-year follow-up, no patient required tracheostomy tubes. In open approaches combined with reconstructive procedures, temporary tracheostomy is always required.

Patients are routinely admitted to the intensive care unit. Immediate postoperative care focuses on transitioning to oral intake of a soft diet and medications, infection prophylaxis and pain management. All surgical procedures for oropharyngeal cancer are extremely painful. Therefore narcotic analgesia should be administered parentrally and subsequently transitioned to oral intake. If pain is too severe to permit oral intake, a nasogastric feeding tube

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will need to be temporarily placed for administering medications and nutrition. The patient is followed-up and re-examined in 12–14 days after discharge and instructed on diet, and swallowing therapy. If the patient was discharged with a nasogastric feeding tube, an evaluation of swallowing by a speech pathologist is required. If the patient shows adequate swallow function and airway protection, the tube is removed [15].

Three main issues arise from curative surgical treatment of oropharyngeal cancers [1]:

- Sequelae or complications from treatment
- Functional outcomes (speech and swallowing)
- Management of recurrent or persistent disease

Management of postoperative complications

When surgery is used as part of, or as a single way of treatment for OPSCC, correction of preoperative nutritional deficits and placement of a percutaneous gastrostomy tube to maintain appropriate nutrition significantly decreases incidence of postsurgical complications [21]. These complications can be classified into local (bleeding, necrosis, neck abscess, flap failure, fistula formation, tongue/dental paresthesia, velopharyngeal insufficiency) and general (cardiovascular, lung, renal, cerebral).

Bleeding after surgical resection can be minor or major. Minor mucosal bleeding can occur in the first 2 weeks. This bleeding is usually managed with conservative measures (ice water, digital pressure, hemostatics, anticoagulant avoidance) [15]. Major hemorrhage can result in airway compromise and death [22]. The surgeon can decrease risk through meticulous intraoperative hemostasis, careful dissection, and ligation of the tonsillar and lingual arteries during neck dissection. Temporary tracheostomy is very important in securing the airway, in cases of major bleeding.

Neck abscess can develop secondary to an unrecognized communication between the oropharynx and the neck. This usually presents as delayed swelling and erythema in the neck, and spontaneous drainage and fistula formation if not recognized and managed. Prevention requires accurate intraoperative closure of any communication. If a fistula occurs despite these measures, it should be managed by opening the incision, draining, cleaning the cavity with saline and peroxide, daily packing with iodoform gauze and appropriate antibiotics [15].

Management of tongue and dental paresthesias relies mainly on conservative measures. Resection of tumors involving the soft palate can result in subsequent velopharyngeal insufficiency. If less than 50% of the palate is resected, these symptoms may alleviate over the following 3–4 months. If more than 50% of the palate is resected, a flap may be required. Delayed pharyngeal healing can occur in patients who underwent preoperative radiotherapy, and in those with malnutrition, immunodeficiency or persistent tumor. Delayed healing presents with pain, necrosis and ulceration at the surgical site. If this persists for more than 3 months postoperatively, biopsy is mandatory to rule out persistent malignancy [15].

Post-irradiation neck dissections are associated with increased frequency and severity of surgical complications, most commonly infection, necrosis, and fistula formation [23].

Functional outcomes

Evaluation of speech and deglutition is of significant importance in the postoperative care of OPSCC.A recent study assessed functional outcomes of patients with base of tongue carcinoma treated via operative and nonoperative strategies. The results suggest that the tongue remained dysfunctional in both groups [24]. Evaluating speech function post-surgery, it was concluded that choice of method to repair the defect, percentage of tongue resected, and percentage of soft palate resected had the strongest relation with overall speech function 3 months after treatment [25]. Selection of the most appropriate reconstructive procedure following primary resection is of major importance. Functional outcome is better after primary reconstruction, when compared with secondary reconstruction, because primary reconstruction results in less fibrosis. Irrespective of surgical management, surgical rehabilitation can be augmented through nonsurgical measures [26]. In most patients, many of the global and disease-specific quality-of-life parameters initially worsen, due to the extensive nature of the surgery and subsequent adjuvant therapy. Most of them return to baseline by 6 months post-treatment and exceed pre-treatment quality-of-life values by 12 months [27,28]. The consensus conclusion is that use of large resections and reconstruction is justified, despite initial worsening of measured criteria. Extensive resection controls local disease whereas reconstruction restores reasonable functional status [29,30].

Swallowing is one of the most important functions of the oropharynx; it can be significantly impaired secondary to surgical treatment. The incidence of post-treatment dysphagia is of major concern. An adequate swallowing function can substantially improve patient quality of life.

Proponents of the transoral approach for oropharyngeal cancer argue that it offers better functional outcomes compared with open procedures or nonsurgical treatment, e.g., chemo/radiotherapy. Several studies report good swallowing results following transoral surgery (laser or robotic). Rich et al. [31] evaluate swallowing function after TLM for 58 patients with advanced tonsillar cancer. Some 82% presented good swallowing 1 month after surgery. At 3 months the proportion decreased to 55%, following the administration of adjuvant therapy, and increased to 89% at 1 year.

Haughey et al. [32] report prevalence of gastrostomy tubes after transoral resection in patients with advanced oropharyngeal cancer. The prevalence was 18.8% after 1 year, 9.3% after 2 years and 3.4% after 3 years. In a cohort of 102 patients with squamous cell carcinoma of the tonsil treated by TLM, Canis et al. [33] report an average duration of nasogastric feeding tube placement of 10 days in 64 patients (63%). In this group of 64 patients, the nasogastric tube had to be replaced by gastrostomy tubes in 4 patients (4%).

A study comparing TLM to LSM reports similar swallowing rates for the two groups at discharge [16]. Swallowing function recovered in half the time in the TLM group. A small number of patients were discharged requiring tube feeding in the TLM group (4% versus 29%).

Skoner et al. retrospectively examine swallowing function in patients treated with surgery and postoperative radiotherapy [30]. These authors evaluate the outcomes of 20 patients with stage 3 and stage 4 who underwent surgical removal, free flap reconstruction, and

postoperative radiotherapy. All patients who underwent tracheotomy were successfully decannulated; average time was 15 days. At 4 months post procedure, 10 patients (50%) were able to eat without a feeding tube. The other 10 patients required an extended tube-feed supplementation, although 6 of these patients were also eating by mouth.

Treatment of swallowing disorders requires proper assessment using one of the available methods: video fluoroscopy or Fiber-Optic Endoscopic Evaluation of Swallowing (FEES) [23]. Studies suggest that pre-treatment initiation of swallowing exercises improves post-treatment outcomes [34]. A multidisciplinary team (head and neck surgeon and speech therapist) is required for optimum results.

Therapeutic swallowing interventions [23] can include:

- Pharyngeal or cervical esophageal dilation (in cases of pharyngoesophageal stenosis)

- Diet modification (altering food consistency, or strategies such as having solids followed by liquids)

- Exercises to strengthen the swallowing mechanism

- Swallowing techniques, including supraglottic swallowing technique and hyolaryngeal elevation maneuver

Management of recurrent/persistent disease

Recurrence is not a rare event in oropharyngeal cancer [35]. Follow-up of these patients aims at early recognition of locoregional recurrence and detection of second primary cancers. The reported incidence of second malignancies is 3–6% per year [1]. A suggested follow-up protocol would include monthly examination in the first year following completion of curative treatment. Subsequent examinations should be scheduled every 2 to 3 months in the following 2 years, then every 4 to 5 months for the fourth year, and on an annual basis thereafter. The role of radiological imaging (CT/MRI and positron emission tomography) is under investigation. Some authors suggest that a chest radiograph should be performed annually [36].

The standard options for management of recurrent disease include surgical resection if radiation therapy fails and if technically feasible, radiation if surgery fails and if not previously administered, and surgical salvage if surgery fails and if technically feasible. Other modalities include chemotherapy, hyperthermia with further radiotherapy, electroporation [1].

Conclusion

Postoperative care plays an important role in surgical treatment of oropharyngeal cancer. Appropriate management of postoperative complications and of recurrent and persistent disease, accompanied by an obvious improvement in quality-of-life parameters (speech, deglutition), are the most important objectives. Quality of life may be considered a critical outcome, surpassed only by survival rates. However, in some instances, patients are more satisfied with better quality of life than with longer life.

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