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KEY WORDS:

TROS IN MANAGEMENT OF OROPHARANGEAL CARCINOMA: A REVIEW

Tapender Singh MS, Civil Hospital, Paonta Sahib, Sirmour, HP.

Manoj Kumar Gandhi* Medical Officer, RHFWTC, Chheb, Kangra, HP. *Corresponding Author

Head and neck cancer is a very heterogeneous group of tumours, yet in many ways treated similarly. The origin of majority of tumours of head and neck is from squaamous cells which lie in the mucosa, lining the oral cavity, the oropharynx, the hypopharynx and the larynx, and hence the name squamous cell carcinomas (SCCs).

Cancers of head and neck are the major leading cause of mortality accounting for around 30-40% of all cancers[1]. There has been an increase in the incidence of oropharyngeal cancers and because of increased risk of human papilloma virus as an emerging factor in the young patients it has shown an increased incidence in young patients[2].

Due to higher incidence of head and neck cancers in India, the prevalence of HPV related head and neck cancers is important with prevalence varying from 22.8% in north [3] and 44% in south[4].

There are various treatment modalities for squamous cell carcinomas namely surgery, radiotherapy and chemotherapy, often used in combination. For head and neck cancer in general, the smallest tumours can usually be treated with surgery or radiotherapy alone, while more advanced need multiple modalities. There are exceptions though, due to either differences in surgical accessibility or expected response to therapy.

A new revolution and most discussed subject in the field of surgery today is robotic surgery. Till this point of time, however the drive to develop and obtain robotic devices has been largely driven by the market. It is beyond doubt that this field of surgery will become an important surgical tool in the armamentarium in near future.

Robotic surgery is a new and exciting technology that is taking the surgical profession by leaps and bounds. There is better local control and functional outcomes for the oropharyngeal tumors with transoral robotic surgery[5-7] in head and neck surgery. High definition video camera, surgical control and high dextriety has played a crucial roles in excision of tumors which was considered inaccessible earlier by open surgical procedures. Transoral Robotic surgery is major advancement in the minimally invasive endoscopic way to manage the head & neck tumors.

Transoral robotic surgery (TORS) was first introduced in [8] by Weinstein *et al* with a case report of a supraglottic laryngectomy in a canine model and by MacLeod and Melder [9], who reported the excision of a vallecular cyst in a human patient with a setup time of 75 min and a surgical time of 30 min. Since these early reports, the development of TORS has been steadily progressing and many other studies on TORS in animal cadavers, human subjects, and various head and neck cancer sites have been published.

Because of the possibility of obtaining superior visualisation and complete resection of tumours with wide margins, TORS seems to represent an alternative to open or endoscopic/ microscopic approaches in oral and pharyngolaryngeal oncology—particularly with 5-mm instruments—that allows improved vision, greater ease of use, and a shorter operating time [10].

Benefits of TROS:

Functional outcome:

Previous literature on TORS support impressive functional outcomes with low rates of gastrostomy dependency, prompt decannulation, and resumption of normal oral intake. Genden *et al* [11] reported the ability to tolerate an oral diet at a mean of 1.4 days after surgery without any patients requiring gastrostomy tubes. Iseli *et al* reported that 83% patients were tolerating an oral diet within 14 days, while 17% required a feeding tube at 12-month follow-up[12]. The majority of the authors reported a low rate of tracheotomy for patients undergoing TORS. Moreover, most of those patients were decannulated within two weeks and no patients required tracheotomy tube at one year after surgery [13].

Oncological outcome: The oncological outcomes from TORS are slowly emerging in the literature and they seem promising [13]. In the cohort study, on 47 patients with advanced oropharyngeal carcinoma treated with TORS, Weinstein *et al* reported a local recurrence rate of 2%, a regional recurrence rate of 4%, and a distance recurrence rate of 9% at a minimum of 18 months of follow-up. Overall survival rates were 96% at one year and 82% at two years, with a disease-specific survival of 98% at one year and 90% at two years. The disease-free survival was 96% at one year and 79% at two years. Extracapsular extension in the metastatic nodal disease was found to be statistically affecting the overall survival rates, 38% of the patients avoided chemotherapy and, because of the high rate of negative margins, 11% did not receive adjuvant chemoradiotherapy [14].

Quality of life: Even if the most important outcome for cancer patients is overall survival, in patients with head and neck cancer, QOL may really be affected by psychological impact of loss of function and physical disfigurement. This has led to a shift to not only organ-preservation treatments, but also function-preservation treatments. Frequent problems include difficulty with speech, respiration, and eating [13]. Leonhardt *et al* reported a return to normal swallowing function and diet one year after surgery in 38 patients with oropharyngeal SCC treated with TORS, while the speech domain was significantly reduced even one year after surgery. They reported that patients who had TORS followed by chemoradiation had significantly lower swallowing scores compared with those without [15]. The overall hospital stay is reported to be shorter for TORS patients than for those who would have otherwise undergone an open approach. In the case series of Moore *et al*, all the 35 patients were discharged from the hospital within six days [16]; in the study of Boudreaux *et al*, the mean hospital stay reported was 2.6 days [17], whereas in the experience of Weinstein *et al*, it was between five and seven days [18,19].

CONCLUSION:

Development of TORS has greatly facilitated the minimally invasive surgical approach for head and neck carcinoma, circumventing many of the technical limitations commonly

associated with transoral laser microsurgical techniques, such as line of sight and two-handed surgery.

While health care continues to battle the competing forces of improved care and reduced costs, TORS may be able to achieve these two conflicting goals. This treatment modality has demonstrated favorable oncologic and functional outcomes while reducing costs by decreasing adjuvant therapy and its associated morbidity. However, to reap these benefits the surgeon must exercise appropriate patient selection. This practice necessitates consideration of multiple patient and tumor-related characteristics. When these principles are applied, TORS has shown efficacy with both early and advanced-stage OPSCC. This technique may also play a role in improving the treatment of those with CUP and recurrent disease.

However not all the patients are good candidates for TORS because some of them may present some limiting factors, mostly affecting proper surgical exposure, such as trismus, narrow arched mandible, full dentition, and retrognathia [20]. Access to the tumour may also be influenced by the site and the extension of the tumour, and the equipment employable by the surgeon [11].

In conclusion, TORS has proven to be a safe and feasible treatment for tumours of the upper aerodigestive tract, and its continuing use and development is encouraged; the results of the published articles are still not sufficient to validate the oncological safety of TORS and further long-term prospective trials are still needed to confirm those results.

REFERENCES

1. Mishra A, Mehrotra R. Head and Neck cancer, Global burden and regional trends in India. Asian Pac J cancer Preview. 2014;15:537-550.
2. Pytyma KB, Dahlstrom KR, Stwegis EM. Epidemiology of HPV associated oropharyngeal cancer Oral oncol 2014;50:380-386.
3. Bahl A, Kumar P, Dar L, Prevalence and trends of human papilloma virus in oropharyngeal cancer in a predominantly North Indian population Head and Neck. 2014;36:505-510.
4. Balaram P, Nahna Kumari KR, Abraham E . Human papilloma viruses in 91 oral cancers from Indian betel quid chewers- high prevalence and multiplicity of infections. Int J cancer. 1995;61:450-454.
5. Hockstein NG, O'Malley BW Jr and Weinstein GS. Assessment of intraoperative safety in transoral robotic surgery Laryngoscope. 2006;116 (2):165–8
6. Weinstein GS et al. Transoral robotic surgery: radical tonsillectomy Arch Otolaryngol Head Neck Surg.2007;133(12):1220–6.
7. Weinstein GS et al. Transoral robotic surgery: supraglottic partial laryngectomy Ann Otol Rhinol Laryngol. 2007;116(1):19–23.
8. Weinstein GS et al. Transoral robotic surgery: supraglottic laryngectomy in a canine model Laryngoscope. 2005;115(7):1315–9.
9. McLeod IK and Melder PC. Da Vinci robot-assisted excision of a vallecular cyst: a case report Ear Nose Throat J. 2005;84(3):170–2.
10. O'Malley BW Jr, Weinstein GS and Hockstein NG. Transoral robotic surgery (TORS): glottic microsurgery in a canine model J Voice. 2006;20:263–8
11. Genden EM, Desai S and Sung CK. Transoral robotic surgery for the management of head and neck cancer: a preliminary experience Head Nec. 2009;31(3):283–9.
12. Genden EM et al. The role of reconstruction for transoral robotic pharyngectomy and concomitant neck dissection Arch Otolaryngol Head Neck Surg 2011;137(2):151–6.
13. de Almeida JR and Genden EM. Robotic surgery for oropharynx cancer: promise, challenges, and future directions Curr Oncol Rep. 2012;14 (2): 148–57
14. Iseli TA et al. Functional outcomes after transoral robotic surgery for head and neck cancer Otolaryngol Head Neck Surg. 2009;141(2):166–71.
15. Weinstein GS et al. Transoral robotic surgery for advanced oropharyngeal carcinoma Arch Otolaryngol Head Neck Surg. 2010;136(11):1079–85
16. Ghanem TA. Transoral robotic-assisted microvascular reconstruction of the oropharynx Laryngoscope. 2011;121(3):580–2
17. Cohen MA et al. Transoral robotic surgery and human papillomavirus status: Oncologic results Head Neck. 2011;33(4):573–80
18. O'Malley BW et al. Transoral robotic surgery (TORS) for base of the tongue neoplasms Laryngoscope. 2006;116(8):1465–72
19. White HN et al. Transoral robotic-assisted surgery for head and neck squamous cell carcinoma: one- and 2-year survival analysis Arch Otolaryngol Head Neck Surg 2010;136(12):1248–52
20. Hurtuk A et al. Outcomes of transoral robotic surgery: a preliminary clinical experience Otolaryngol Head Neck Surg. 2011;145(2):248–53