

EVALUATION OF SUPRACRICOID PARTIAL LARYNGECTOMY WITH CRICOHYOIDOEPIGLOTTOPEXY IN A TERTIARY HOSPITAL

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OBJECTIVE: To present cases of supracricoid partial laryngectomy with Cricohyoidoepiglottopexy (SCPL-CHEP) done in this institution and describe the operative procedure performed in the patients.

To evaluate the post-operative deglutition and speech of patients who underwent supracricoid partial laryngectomy with cricohyoidoepiglottopexy (SCPL-CHEP).

To determine the association factors as age, length of hospital stay, day of decannulation, aspiration, stage of cancer lesion and speech outcome among post-operative deglutition of patients who underwent supracricoid partial laryngectomy with cricohyoidoepiglottopexy (SCPL-CHEP).

DESIGN: Restrospective analytic study

SETTING: Tertiary medical center

SUBJECTS: Seven male patients with a mean age of 66 years (range, 52-87) with T1 and T2 glottic lesions who underwent supracricoid partial laryngectomy with cricohyoidoepiglottopexy (SCPL-CHEP) in a tertiary medical center.

RESULTS: Seven cases of T1 to T2 squamous cell carcinoma of the glottis who underwent supracricoid partial laryngectomy with cricohyoidepiglottopexy (SPL-CHEP) were presented. Post-operatively, all patients were successfully decannulated. The speech and aspiration grading of the seven patients were evaluated and scored. Post-op deglutition was evaluated using the Grading Scale of the Fiberoptic Endoscopic Evaluation of Swallowing, among the seven cases one patient had aspiration and retention and underwent gastrostomy while the remaining six patients were able to return to normal deglutition. In terms of speech, all seven patients were graded with moderate dysphonia using Pinho's classification of auditory-perceptive evaluation. Statistical analysis showed no significant correlation between hospital stay and speech, however an inverse trend was noted between age, stage of cancer lesion, decannulation of tracheostomy and aspiration score.

CONCLUSION: This paper presented seven (7) patients who underwent conservative surgery using SPCL with CHEP. Six out seven patients were assessed with normal post-op deglutition while one patient had marked spillage, retention and aspiration. In terms of speech all seven (7) patients were graded with moderate dysphonia. Due to the limited number of cases no significant correlation was noted between length of hospital stay and speech but the study showed an inverse trend between the age of patients, decannulation of tracheostomy, NGT removal, and aspiration. Supracricoid Partial laryngectomy is an organ preserving surgical technique with high local control rate of disease while preserving swallowing and speech.

KEYWORDS: Supracricoid Partial Laryngectomy, Cricohyoidoepiglottopexy, and Organ Preservation, Radiation therapy

INTRODUCTION

According to WHO, cancer or malignant neoplasm is the third most common cause of death in the Philippines¹. The percentage of laryngeal cancer is one to 2% of malignant tumors worldwide² and ranks 12th type of cancer in the Philippines³. It is associated with smoking and alcohol abuse, professional exposure to chemicals and a family history of cancer². It affects men aged between 50 to 60 years although women and individuals of any age may also acquire this type of cancer, and the main surgical procedure recommended is partial, subtotal or total laryngectomy^{2,4}.

Total laryngectomy is said to be the mainstay of treatment for advanced laryngeal cancer⁴. Theodore Billroth was the first to perform this procedure in 1873 and was perfected through years by increasing expert advocates. The overall 5 year survival of patients after total laryngectomy is around 70%, and reported to be one of the highest rates of survival among cancer cases⁵, however despite the good prognosis, removal of the larynx requires tracheostoma. The quality of life assessments were performed in 2002 in patients who have received a near total laryngectomy or total laryngectomy shows that permanent tracheostomy, regardless of voice quality is one of the factors with negative psychosocial impact on patients. Therefore organ preservation has a positive effect on patient's perception of self and adjustment to cancer therapy, though the function is not perfectly maintained¹¹.

Protocols regarding treatment of laryngeal cancer also include the organ preservation, its principle is to control the disease with preservation of laryngeal function for speech and swallowing. The term "organ preservation" was used to denote the advent of combined chemotherapy and radiation since it does not alter the anatomy of the larynx thereby the physiologic function of the larynx was not altered⁸. Supracricoid partial laryngectomy (SCPL) is an organ preserving surgical technique allowing speech and swallowing without tracheostomy¹². This type of surgery is limited to early stage of glottic cancer¹³. And only few surgeons in our country were practicing this procedure.

This paper aims to present cases series of supracricoid partial laryngectomy with Cricohyoidoepiglottopexy (SCPL-CHEP) done in this institution and describe the operative procedure performed with the patients. To evaluate post-operative deglutition and speech intelligibility of supracricoid partial laryngectomy who underwent cricohyoidoepiglottopexy (SCPL-CHEP). To determine the association factors as age, length of hospital stay, day of decannulation, aspiration and speech outcome among patients who underwent supracricoid partial laryngectomy with cricohyoidoepiglottopexy (SCPL-CHEP).

DEFINITION OF TERMS

- Tracheostoma - This is a permanent opening of the trachea for airway after total laryngectomy²⁰

- Fiberoptic Evaluation of Swallowing (FEES) - Passing an endoscope through the nasal cavity, nasopharynx, and pharynx to evaluate swallowing¹⁸
- Spillage - Food bolus entering the hypopharynx more than 30 seconds before the onset of swallowing as seen in video-endoscopic evaluation ¹⁹.
- Aspiration – Passage of food contents into the larynx or respiratory tract below the level of the true vocal folds²¹
- Retention – Retained food bolus entering the hypopharynx as seen in video-endoscopic evaluation¹⁸

METHODOLOGY

This is a retrospective study from 2001 to 2013. All patients who underwent supracricoid partial laryngectomy with cricohyoidoepiglottopexy (SCPL-CHEP) done in this institution were included in the study. Only patients who were at early stage of Laryngeal cancer are included in the study, either T1 or T2. A total of seven (7) male patients were included in the study, five (5) patients were T1aNoMx while two (2) remaining were T2NoMx glottic or supraglottic, moderately to well-differentiated squamous cell cancer of the larynx with one of the seven patients having a selective lateral neck dissection. (see appendix ,Table 1)

All patients had post-operative evaluation of swallowing through the standard Fiberoptic

endoscopic evaluation of swallowing (FEES) technique. A topical anesthesia and decongestant was applied at the nasal cavity, followed by insertion of a flexible endoscope attached to a camera. The base of tongue, throat and larynx can be visualized. The patient was asked to drink liquid, followed by puree, then soft food then lastly with a solid food, as the patient eats and drinks, the examiner will be able to assess swallowing. Objective evaluation of swallowing was assessed with the use of a new modification criteria and protocols of FEES¹⁴ described by Zacharek¹⁵ at al. and Schindler et. al⁶. The parameters include premature spillage of material, retention/pooling of material and/or secretion and the entrance of material and/or secretion into the larynx or trachea and the presence/absence of a reflex cough. The Parameters were scored based on a scale from one (1), which represents poor performance to five (5), which corresponds to excellent performance (See appendix, Table 3).

Speech was assessed based on auditory-perceptive evaluation according to Pinho², graded from 0 with normal voice to 3 with severe dysphonia (see appendix, Table 5).

Spearman's statistical analysis was used to determine the association among other factors such as length of hospital stay, day of tracheostomy decannulation, age, speech, aspiration, day of NGT removal and stage of cancer (see Appendix, Table 7). The mean of each variables mentioned were also computed (see appendix, Table 8)

SURGICAL TECHNIQUE of Supracricoid Partial Laryngectomy with Cricohyoidoepiglottopexy (SCPL-CHEP) by Laccourreye under general anesthesia was done as follows:

I. Exposure

NGT was initially inserted. A U-shaped skin incision between the mastoid process is done to allow neck dissection to be performed (Fig. 1). A superiorly based flap is elevated 1 cm above the hyoid bone to prevent skin retraction at the time of closure.



Figure 1

The sternohyoid and thyrohyoid muscles are transected along the superior border of the thyroid cartilage. The sternohyoid muscles are then inferiorly mobilized in order to expose the underlying sternothyroid muscles and transected along the inferior border of the thyroid cartilage (Fig. 2).

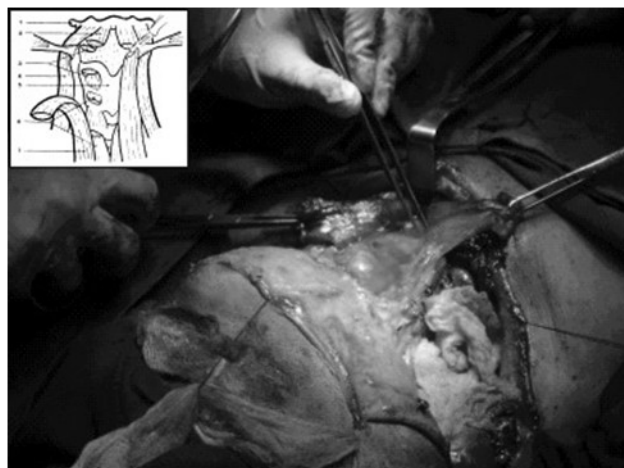


Figure 2

The inferior pharyngeal constrictor muscle and the external thyroid perichondrium are transected along the posterior border of the thyroid cartilage lamina (Fig. 3).

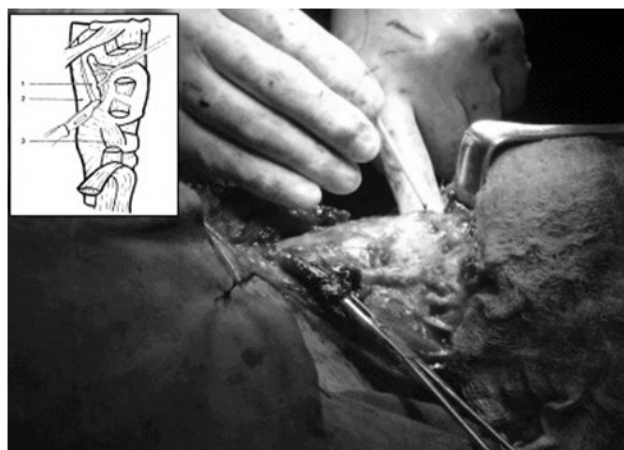


Figure 3

The pyriform sinuses are released by use of freer elevator. The cricothyroid joints are disarticulated. The isthmus of the thyroid gland is transected and ligated. A blunt dissection is performed with a finger along the anterior wall of the cervicomediastinal trachea to the level of the carina to allow upward mobility of the trachea at the time of closure.

II. Resection

Once the exposure is completed, the larynx is entered superiorly through a transverse transepiglottic laryngotomy along the superior border of the thyroid cartilage and inferiorly through a transverse medial cricothyroidotomy along the superior border of the cricoid cartilage (Fig.4).

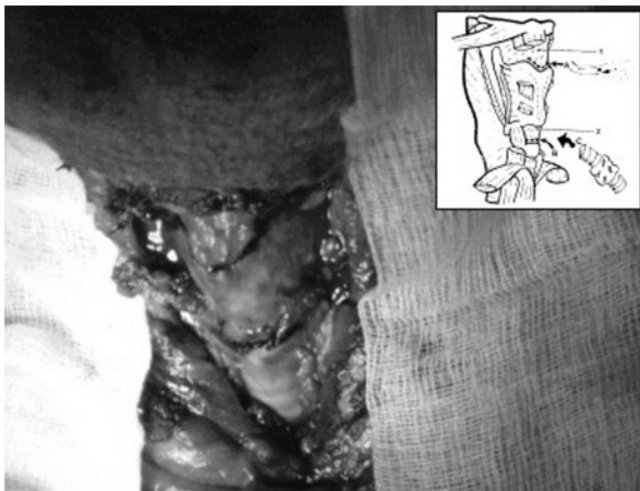


Figure 4

The oroendotracheal tube is removed and a tracheal tube is inserted via the medial cricothyroidotomy. The surgeon moves to the head of the table. The larynx is grasped with an Allis clamp and pulled inferiorly and anteriorly. The precise tumor location can be ascertained by direct visualization from above.

The endolaryngeal resection is then performed under direct vision starting on the non-tumor bearing side which on our case is the left side. A vertical prearytenoid incision from the aryepiglottic fold to the superior border of cricoid cartilage is performed with scissors. This first cut is made by placing one blade of the scissors in the laryngeal lumen and the

other blade between the elevated thyroid perichondrium and the thyroid cartilage.

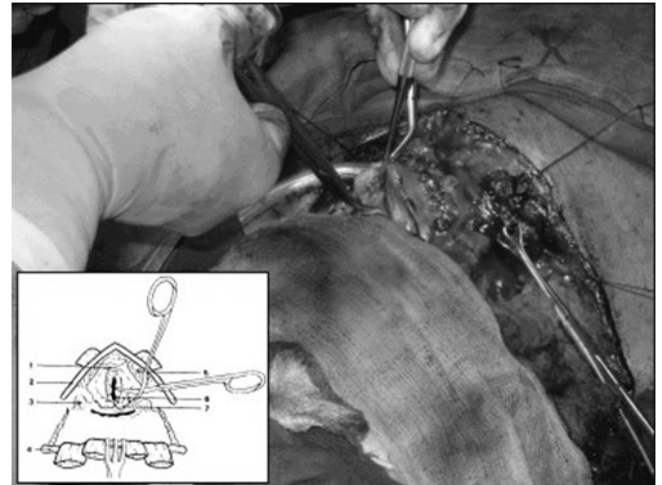


Figure 5

The vertical prearytenoid incision and the medial transverse cricothyroidotomy are then connected on the non-tumor bearing side. The thyroid cartilage is then gripped between the surgeon's hands and broken forward along the midline. The fracture allows complete visualization of the tumor-bearing side. Excision of the tumor is then performed under direct vision with use of the horizontal incision along the superior border of the cricoid cartilage and a vertical prearytenoid incision (Fig.6).

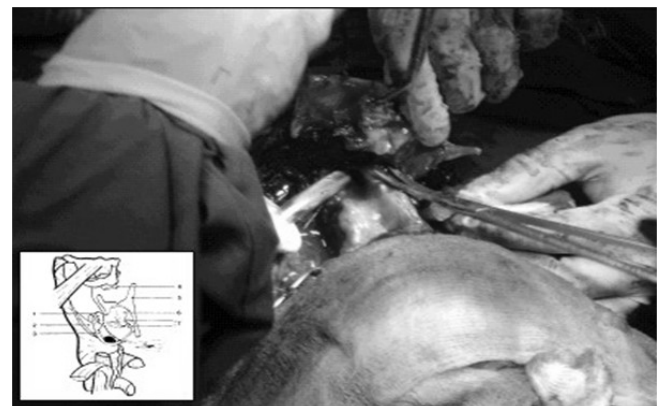


Figure 6

III. Closure/Reconstruction

The mucosa of only the upper part of the arytenoids is sutured to cover the exposed cartilage. Each remaining arytenoid cartilage is then pulled forward to the postero-lateral part of the cricoid cartilage to avoid posterior rotation of the arytenoid cartilage.

Impaction of the hyoid bone to the cricoid cartilage is then performed. Three submucosal 0 vicryl sutures are looped around the cricoid cartilage, passed through the remaining epiglottic cartilage and looped around the hyoid bone (Fig. 7).

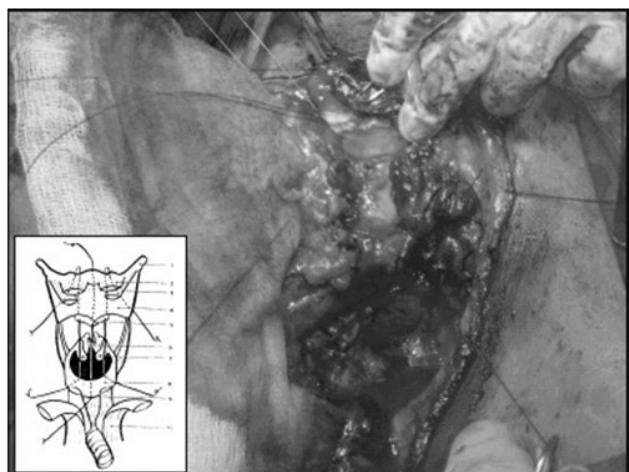


Figure 7

First in the midline, the other two are set bilaterally .5 cm from the midline. The sutures are then pulled together to allow the previously released cervicomedistal trachea to move upward. At this point, tracheotomy is performed to allow for ventilation while closure is performed. The three sutures are cinched tightly so as not to leave a gap between the cricoid cartilage and the hyoid bone. Two suction drains are placed, then skin closure is performed in two layers.

RESULTS

All seven patients underwent Supracricoid Partial Laryngectomy with Cricohyoidoepiglottopexy in our institution. All patients were men with mean age of 65 (see table 8). Swallowing of all seven patients were assessed with the use of a new modification criteria and protocols of FEES² described by Zacharek¹⁵ at al. and Schindler et. al⁶. Table 4 (see appendix) shows the results of Grading scale of the Fiberoptic Endoscopic Evaluation of swallowing (FEES) with six (6) patients having a point value of 5 which corresponds to no spillage of material, no retention or pooling and with no entrance of material into the larynx or trachea, while one (1) patient had a point value of 2 corresponds to marked spillage, marked retention/pooling and with entrance of material into trachea.

All patients in the study presented a moderate dysphonia through Pinho's classification based on auditory-perceptive evaluation (see appendix table 6).

NGT was placed in all patients during the time of operation, this was subsequently removed and all patients were started with oral feeding. The computed average day of removal of NGT was on the 15th post operative day (see appendix, table 8), however one (1) patient accidentally removed his NGT on the 4th post-operative and subsequently underwent gastrostomy tube on his 24th post-operative day.

Spearman statistical analysis (see appendix, table 7) was used to evaluate the association of hospital stay, day of tracheostomy decannulation, age, speech, aspiration, day of removal of NGT and Stage of cancer. The study failed to show a significant correlation as shown by all correlation coefficients with p values of >0.05 . Although an insignificant p value were noted, a trend showing an inverse correlation that as the age decreases the removal of NGT is prolonged, the stage of cancer lesion is advanced and the aspiration score increases. Decanulation of tracheostomy showed also an inverse correlation trend seen in that those whose age is <60 years old, the decanulation time was longer than those whose age is >60 years old (see appendix table 10).

All patients were discharged with average stay in the hospital of 22 days, while the computed average day of decannulation of tracheostomy was 10 days (see appendix, table8).

DISCUSSION

Supracricoid Partial Laryngectomy with Cricohyoidoepiglottopexy (SCPL-CHEP) is a conservative surgical technique for treating selected laryngeal carcinomas classified as T1-T4². Supracricoid laryngectomy, is a form of subtotal laryngectomy, described by Majer and Rieder in 1959 and thereafter by Labayle and Bismuth in 1972⁷. It was Laccourreye who coined the name “partial horizontal supracricoid laryngectomy” (SCPL), which for him best describes the surgical procedure and resection and “cricohyoidoepiglottopexy” (CHEP),

which pertains to the mode of reconstruction³ that approximates the cricoids to the hyoid bone, for glottic region tumors⁷. The surgery removes the paraglottic and pre glottic space which are the area of extension of laryngeal cancer.

Supracricoid Partial laryngectomy is based on the concept that the main functional anatomical unit of the larynx is the cricoarytenoid unit which includes the arytemoid cartilage, intact cricoarytenoid joint, posterior and lateral cricoarytenoid muscles and recurrent and superior laryngeal nerves⁹. The cricoarytenoid unit and not the vocal folds allows physiologic speech and swallowing and thus the primary advantage of this type of resection is the absence of permanent tracheostoma while maintaining the physiologic speech and swallowing^{8,9}.

Early laryngeal cancers with T1 and T2 should be treated with the intent to preserve the larynx. In 1990, Laccourreye presented 36 patients who underwent the procedure, all of which recovered physiologic deglutition and phonation, and none of them required a permanent tracheotomy, his paper was presented as a useful alternative to radiotherapy and included that the 3-year actual survival rate was 86.5%⁷.

Supracricoid partial laryngectomy is a reasonable alternative to radiotherapy¹⁶, however in the study of Szyfter, radiotherapy had a local control rate of 79% while partial laryngectomy had a better initial control rate of 84%. Several studies show that SCPL results

with low recurrence rate and acceptable 5-year actuarial survival rate even in the elderly, among the T1-T2N0 tumor with invasion of the anterior commissure, 3-year and 5-year survival were 93.3% and 86.5%, respectively, recurrence rate was 1.8%⁷.

In the study by Laccourreye, H. et al.⁷ which included T1b and T2 lesions who underwent SCPL with CHEP, the following indications were: (1) Bilateral T1 glottic carcinomas with or without anterior commissure involvement; (2) Unilateral T1 glottic carcinomas with ant. commissure involvement; (3) T1 glottic carcinomas with various areas of dysplasia or hyperplasia; and (4) unilateral or bilateral T2 glottic carcinomas w/ or w/out impaired mobility of the true vocal cord³. Later studies by Dufour et al.¹⁷, showed that SCPL provided a significant advance in management of selected laryngeal cancer classified as T3.

Most of the patients admitted in this institution were at advanced stage, in this study, only seven patients were qualified to undergo SCPL due to its stringent indications,. The lesions of patients included in the study were T1 to T2 tumors with both arytenoids mobile, Five patients were T1 while the remaining two were T2. The preservation of both the arytenoids in all patients were done, hence the cricoarytenoid unit was preserved which is said to be the functional unit of larynx, allowing physiologic speech and swallowing in all patients.

One of the seven cases developed marked aspiration, this was due to the

accidental removal of the NGT of the patient, thus delaying the wound healing causing marked retention and entrance of material into the trachea, patient subsequently underwent gastrostomy tube insertion on his 24th post-operative day.

Swallowing was evaluated with the use of new FEES protocol, while the remaining six (6) patients do not have retention/pooling with no entrance of material into the trachea. The resumption of normal deglutition was attributed to bilateral preservation of both recurrent laryngeal nerves and superior laryngeal nerves that maintains the sensation and mobility of the remaining laryngeal structures⁷. Aside from nerve preservation, It was also observed that preventive precautions for aspiration also includes suturing and positioning the cricoarytenoid unit as anterosuperiorly as possible, early decannulation and early swallowing rehabilitation¹⁰. It was mention in the study of Nemr in 2007, that dysphagia may be further reduced by preserving two arytenoids which was observed in all our patients.

Regarding speech outcome, all seven (7) patients in the series satisfactory moderate grade of dysphonia. It was mentioned earlier that it is the cricoarytenoid unit and not the vocal fold that allow physiologic speech¹¹, though arytenoids do not completely reach a complete closure thereby resulting in air loss during phonation⁸, which explains the variable degree of hoarseness present in all the patients, it remains to have a positive effect on the patients.

Laryngeal cancer frequently occurs around 50-60², in this study the mean age is 66 (52-87). An inverse correlation was noted between age and aspiration score. Correlation indicates that as the age decreases there is increasing aspiration score. An increasing score of aspiration signifies normal, which connotes that younger patients had better healing and showing functional swallowing was preserved, however due the limited sample size significant correlation was not established.

In this study the average day for decannulation was 10th post-operative day, it was made possible because the circumferential integrity of the airway was maintained through impacting the hyoid bone to the cricoid cartilage³. An inverse correlation was noted with decannulation, wherein as the age decreases there is a longer time for decannulation. Factors such as pain and fear of possible outcome may attribute to the result, however since the cases were limited, again significant correlation was not shown.

Stage of lesion was also noted with inverse correlation with age. As the age decreases an advanced stage of lesion can occur. The correlation can't be explained due to the limited number of cases.

Other factors such as speech and hospital stay did not show significant correlation. All patients were subsequently discharged with no complications, with an average 22 hospital days.

All patients have regular follow-up

CONCLUSION

In conclusion we have presented seven (7) patients who underwent conservative surgery using SPCL with CHEP. Supracricoid Partial laryngectomy is an organ preserving surgical technique with high local control rate of disease while preserving swallowing and speech.

Swallowing was evaluated using the new FEES protocol, results showed that six out seven patients were assessed with normal post-op deglutition while one patient had marked spillage, retention and aspiration. In terms of speech all seven (7) patients were graded using the Pinho's Classification based on auditory-perception with moderate dysphonia. Due to the limited number of cases no significant correlation was noted between length of hospital stay and speech but the study showed an inverse trend between the age of patients, decannulation of tracheostomy, NGT removal, and aspiration.

RECOMMENDATION

Due to the limited number of cases, it is therefore recommended to increase the number of sample size in order to obtain a significant correlation between the variables such as age, decannulation of tracheostomy, speech, aspiration, removal of NGT and stage of cancer lesion.

The procedure should be part of armamentarium in laryngeal surgeries and should be considered when discussing treatment plan with the patient with early stage of laryngeal cancer.

REFERENCES

1. WHO. Leading causes of Mortality. Downloaded at <http://www.doh.gov.ph/node/198.html>
2. Nemr, Nair et. al. Functional study of the voice and swallowing following supracricoid laryngectomy. *Rev Bras Otorhinolaryngol.* 2007; 73(2): 151-5.
3. Cancer and the Cancer Philippine Program. Downloaded at: http://jjco.oxfordjournals.org/content/32/suppl_1/S52.full
4. Cummings, C.W., Haughey, B.: Total Laryngectomy and Laryngopharyngectomy, *Otolaryngology, Head and Neck Surgery*, 116: 2229-2241
5. Evans, Montgomery and Gullane, Principles and Practice of Head and Neck Oncology, 2005
6. Schindler, Antonio et. al. Long-term voice and swallowing modifications after supracricoid laryngectomy: objective, subjective, and self-assessment data. *American Journal of Otolaryngology-Head and Neck Medicine and Surgery* 27 (2006) 378-383.
7. Laccourreye H, Laccourreye O, Weinstein G, Menard M, Brasnu D. Supracricoid Laryngectomy with Cricothyroidopiglottopexy: A Partial Laryngeal Procedure for Glottic Carcinoma. *Ann Otol Rhinol Laryngol* 99:1990:pp 421-427.
8. Tufano R. *Otolaryngol Clin North Am.* 2002 Oct;35(5):1067-80.
9. Yuceturk AV, Tarhan S, Gunhan K, Pabuscu Y. Videofluoroscopic evaluation of the swallowing function after supracricoid laryngectomy. *Eur Arch Otorhinolaryngol.* 2005 Mar;262(3):198-203 Epub 2004 Apr 30.
10. Pellini, Raul MD et.al. Functional Outcome of Supracricoid Partial Laryngectomy With Cricothyroidopexy. Downloaded from: <http://archotol.jamanetwork.com>
11. Tufano, R. Organ Preservation Surgery for Laryngeal Cancers. *Otolaryngol Clin N Am* (2008) 741-755.
12. Park, MD et. al. Functional and Oncologic Results of Extended Supracricoid Partial laryngectomy. *Arch Otolaryngol Head and Neck Surg.* Vol 137 (no.11).Nov 2011.
13. Allegra, et. al., Modified Supracricoid laryngectomy: oncologic and functional outcomes in the elderly. *Clinical Intervention in Aging* 2012;7 475-480.
14. Topaloglu, MD et. al. Analysis of Swallowing Function after Supracricoid Laryngectomy with Cricothyroidopiglottopexy. Downloaded from <http://oto.sagepub.com>
15. Zacharek, et. al. Functional outcomes after supracricoid laryngectomy. *Laryngoscope* 2001: 111.1558-1564

16. Szyfter, W. et. al. Outcome after supracricoid laryngectomies in the material of ENT Department, Poznan University of Medical Sciences. *Eur Arch Otorhinolaryngol* (2011) 268:879-883
17. Dufour X, Hans S, De Mones E, Brasnu D, Menard M, Laccourreye O. Local Control After Supracricoid Partial Laryngectomy for “Advanced” Endolaryngeal Squamous Cell Carcinoma Classified as T3. *Arch Otolaryngol Head Neck Surg*. 2004 Sep;130(9): 1092.
18. Nacci, A. et. al. Fiberoptic Endoscopic Evaluation of Swallowing (FEES): proposal for informed consent. *Acta Otorhinolaryngol Ital*. 2008 August; 28 (4): 206-211.
19. Ureta, MD, Narajos, MD, Research , Video-endoscopic Evaluation of Swallowing, PSO-HNS Annual Descriptive Research Contest, 2007
20. Koch, W. Total laryngectomy with tracheoesophageal conduit. *Otolaryngol Clin N Ann* 35 (2002) 1081-1096
21. Marcot, P. Critical Review: Effectiveness of FEES in comparison to VFSS at identifying aspiration. Downloaded from: <http://www.uwo.ca/fhs/csd/ebp/reviews/2006-07/Marcotte.pdf>

APPENDIX

Table 1. Demographics, history, pre-operative findings and management of the seven patients who underwent supracricoid partial laryngectomy from 2001 to 2013.

CASE	(1)	(2)	(3)	(4)
SEX	Male	Male	Male	Male
AGE	67	87	58	69
HISTORY	(+) hoarseness x 2 mos (+) 40-pack year smoker & 3-4 bottles of beer four times a week.	(+) hoarseness x 1 year (+) 47 pack year smoker	(+) intermittent hoarseness x 3 mos (+) 5 pack year smoker	(+) intermittent hoarseness x 2 yrs (+) 36 pack year smoker
HISTOPATH	Well-differentiated squamous cell carcinoma	Well-differentiated squamous cell carcinoma	Well-differentiated squamous cell carcinoma	Well-differentiated squamous cell carcinoma
P.E. (Direct Laryngoscopy Finding)				
OPERATION	Supracricoid laryngectomy w/ CHEP	Supracricoid laryngectomy w/ CHEP	Supracricoid laryngectomy w/ CHEP	Supracricoid laryngectomy w/ CHEP
NECK DISSECTION	Selective lateral neck dissection	None	None	None

Table 1. Demographics, history, pre-operative findings and management of the seven patients who underwent supracricoid partial laryngectomy from 2001 to 2013.

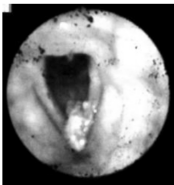
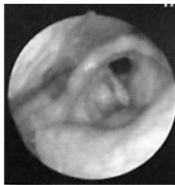
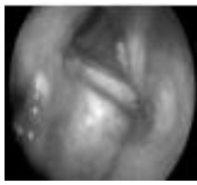
CASE	(5)	(6)	(7)
SEX	Male	Male	Male
AGE	62	52	65
HISTORY	(+) hoarseness x 15 mos (+) 50-pack year smoker & ½ bottles of brandy 2-3 times a week.	(+) hoarseness x 1 year (+) 30 pack year smoker, Occ. alcoholic drinker	(+) hoarseness x 1 year (+) 40-pack year smoker & ½ bottles of brandy 2-3 times a week.
HISTOPATH	Moderately-differentiated squamous cell carcinoma	Well-differentiated squamous cell carcinoma	Moderately-differentiated squamous cell carcinoma
P.E. (Direct Laryngoscopy Finding)			
OPERATION	Supracricoid laryngectomy w/ CHEP	Supracricoid laryngectomy w/ CHEP	Supracricoid laryngectomy w/ CHEP
NECK DISSECTION	None	None	None

Table 2. Post-operative results and findings of the seven patients who underwent supracricoid partial laryngectomy from 2001 to 2013.

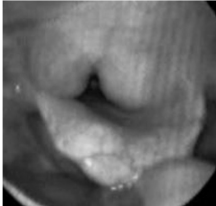
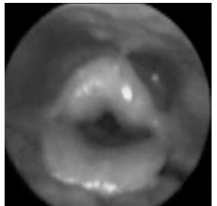
CASE	(1)	(2)	(3)	(4)
TRACHEOSTOMY DECANNULATION	13 th postop day	7 th postop day	9 th postop day	7 th postop day
FLUID CHALLENGE	14 th day sips of water 17 th day general liquid 19 th day soft diet	4 th day NGT removed 13 th day sips of water 24 th day gastrostomy tube insertion	14 th day cold, clear liquids/ice chips then general liquids 16 th day diet as tolerated	12 th day clear liquids then general liquids 13 th ice chips & hard candies
ASPIRATION	None	None	None	None
POST-OP DL FINDINGS	 (+) good bilateral mobility	 (+) good bilateral mobility	 (+) good bilateral mobility	 (+) good bilateral mobility

Table 2. Post-operative results and findings of the seven patients who underwent supracricoid partial laryngectomy from 2001 to 2013. (Continued)

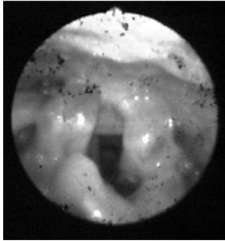
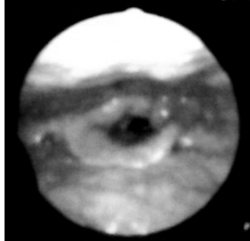
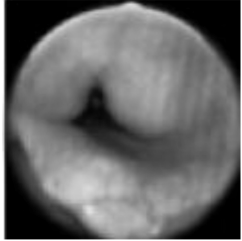
CASE	(5)	(6)	(7)
TRACHEOSTOMY DECANNULATION	6 th post-op day	22 nd post-op day	7 th post-op day
FLUID CHALLENGE	12 th day sips of water 15 th day general liquid 16 th day soft diet	22 nd day sips of water 23 rd day general liquid 26 th day soft diet	13 th day clear liquids then general liquids 17 th soft diet
ASPIRATION	None	None	None
POST-OP DL FINDINGS	 (+) good bilateral mobility	 (+) good bilateral mobility	 (+) good bilateral mobility

Table 3. Grading Scale of the Fiberoptic Endoscopic Evaluation of Swallowing (FEES)

Point Value	Premature Spillage of Material	Retention/Pooling of Material and/or Secretion	Entrance of Material and/or Secretion into the Larynx or Trachea; Presence/Absence of Reflex Cough
1	Severe	Severe retention/pooling	Entrance of material into trachea; no reflex cough
2	Marked	Marked retention/pooling	Entrance of material into trachea; with reflex cough forming
3	Moderate	Moderate retention/pooling	Entrance of material into larynx, remaining above the trachea; no reflex cough
4	Mild	Mild retention/pooling	Entrance of material into larynx, remaining above the trachea; with reflex cough forming
5	None	No retention or pooling	No entrance of material into larynx or trachea; no reflex cough

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Table 4. Results of Seven Patients using The Grading Scale of the Fiberoptic Endoscopic Evaluation of Swallowing

PATIENT	AGE	GRADING SCALE
1	67	5
2	87	2
3	58	5
4	69	5
5	62	5
6	52	5
7	65	5

Table 5. Pinho's Classification on an auditory-perceptive evaluation

0	Normal Voice (absence of hoarseness, roughness/soprosity,asthenia or tension)
1	Mild Dysphonia (hoarse/rough/tense/soprous voice with sonorization)
2	Moderate dysphonia (hoarse/rough/tense/soprous voice with no sonorization)
4	Severe dysphonia (voice with no sonorization)

Table 6. Results of Seven Patients using Pinho's Classification on an auditory – peceptive evaluation

PATIENT	AGE	GRADE
1	67	2
2	87	2
3	58	2
4	69	2
5	62	2
6	52	2
7	65	2

Table 7. Spearmans Correlation showing Hospital stay, Decannulation of Tracheostomy, Speech/auditory –Perceptive Evaluation,Aspiratio/Penetration, NGT Removal and Staging of Seven Patients who underwent SCPL

Correlations			HS	DD	AGE	SPEECH	ASPIRATION	NGT	STAGE
Spearman's rho	HS	Correlation Coefficient	1.000	.519	-.179	.	-.408	.414	.158
		Sig. (2-tailed)	.	.233	.702	.	.363	.355	.735
		N	7	7	7	7	7	7	7
DD	DD	Correlation Coefficient	.519	1.000	-.408	.	.212	.673	.000
		Sig. (2-tailed)	.233	.	.364	.	.648	.097	1.000
		N	7	7	7	7	7	7	7
AGE	AGE	Correlation Coefficient	-.179	-.408	1.000	.	-.612	-.667	-.632
		Sig. (2-tailed)	.702	.364	.	.	.144	.102	.127
		N	7	7	7	7	7	7	7
SPEECH	SPEECH	Correlation Coefficient	.	.	.	.	.	.	.
		Sig. (2-tailed)	.	.	.	.	.	.	.
		N	7	7	7	7	7	7	7
ASPIRATION	ASPIRATION	Correlation Coefficient	-.408	.212	-.612	.	1.000	.618	.258
		Sig. (2-tailed)	.363	.648	.144	.	.	.139	.576
		N	7	7	7	7	7	7	7
NGT	NGT	Correlation Coefficient	.414	.673	-.667	.	.618	1.000	.399
		Sig. (2-tailed)	.355	.097	.102	.	.139	.	.375
		N	7	7	7	7	7	7	7
STAGE	STAGE	Correlation Coefficient	.158	.000	-.632	.	.258	.399	1.000
		Sig. (2-tailed)	.735	1.000	.127	.	.576	.375	.
		N	7	7	7	7	7	7	7

Table 8. Average of Hospital stay, Decannulation of Tracheostomy, Speech/auditory –Perceptive Evaluation,Aspiratio/Penetration, NGT Removal and Staging of Seven Patients who underwent SCPL

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
HS	7	22.29	5.219	1.973
DD	7	10.14	5.728	2.165
AGE	7	65.71	11.011	4.162
SPEECH	7	2.00	.000 ^a	.000
ASPIRATION	7	4.57	1.134	.429
NGT	7	15.86	6.619	2.502

a. t cannot be computed because the standard deviation is 0.

Table 9. Variables including Hospital stay, Decannulation of Tracheostomy, Speech/auditory –Perceptive Evaluation,Aspiratio/Penetration, NGT Removal and Staging of Seven Patients who underwent SCPL

HOSPITAL STAY	DECANNU-LATION OF TRACHEOSTO MY	PATIENTS	SPEECH	ASPIRATION/ PENETRATION	NGT REMOVAL	STAGING OF CANCER LESION
22	13	67/M	2	5	19	T1
27	7	87/M	2	2	4	T1
19	9	58/M	2	5	16	T1
15	7	69/M	2	5	13	T1
18	6	62/M	2	5	16	T2
29	22	52/M	2	5	26	T2
26	7	65/M	2	5	17	T1

Table 10. Comparison of the Hospital Stay, Speech Score, Aspiration Score, Decanulation Score of Patients Aged ≤ 60 y/o and >60 y/o

	< 60 y/o	≥ 60 y/o	P value
Hospital Stay	24.00 $\pm$ 7.07	21.60 $\pm$ 5.13	0.63 (NS)
Decanulation	15.50 $\pm$ 9.19	8.00 $\pm$ 2.83	0.09 (NS)
Swallowing Score	0.00 $\pm$ 0.00 (0)	0.80 $\pm$ 1.79 (0)	0.52 (NS)*
Speech Score	3.00 $\pm$ 0.00	3.00 $\pm$ 0.00	1.00 (NS)

Values are mean $\pm$ SD (Median)

t-test

*Mann Whitney U test