


Grand Rounds

Laryngeal Conservation Surgery - Evaluation of the Supracricoid Laryngectomy



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Learning Objectives

- **Basics:** Anatomy, Staging, Organ Preservation
- **Trends:** Incidence, survival, treatment strategies
- **Chemoradiation:** landmark trials, outcomes, pitfalls
- **Supracricoid Laryngectomy:** Technique, indications, contraindications
- **Compare:** oncologic and functional outcomes of laryngeal preservation strategies

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Laryngeal Cancer Cases - 2013

TABLE 1. Estimated New Cancer Cases and Deaths by Sex, United States, 2013*

	ESTIMATED NEW CASES			ESTIMATED DEATHS		
	BOTH SEXES	MALE	FEMALE	BOTH SEXES	MALE	FEMALE
All sites	1,660,290	854,790	805,500	580,350	306,920	273,430
Oral cavity & pharynx	41,380	29,620	11,760	7,890	5,500	2,390
Tongue	13,500	9,900	3,600	2,070	1,380	690
Mouth	11,400	6,700	4,600	1,800	1,080	720
Pharynx	13,930	11,200	2,730	2,400	1,790	610
Other oral cavity	2,460	1,790	670	1,640	1,260	380
Digestive system	290,200	160,750	129,450	144,570	82,700	61,870
Esophagus	17,990	14,440	3,550	15,210	12,220	2,990
Stomach	21,600	13,230	8,370	10,990	6,740	4,250
Small intestine	3,810	4,670	4,160	1,170	610	560
Colon†	102,480	50,090	52,390	50,830	26,300	24,530
Rectum	40,340	23,580	16,760			
Anus, anal canal, & anorectum	7,060	2,630	4,430	880	330	550
Liver & intrahepatic bile duct	30,640	22,720	7,920	21,670	14,890	6,780
Gallbladder & other biliary	19,310	4,740	5,570	3,230	1,260	1,970
Pancreas	45,220	22,740	22,480	38,460	19,480	18,980
Other digestive organs	5,730	1,600	3,850	2,130	870	1,260
Respiratory system	246,230	124,260	121,970	142,480	90,600	51,880
Larynx	12,760	9,680	2,580	3,630	2,860	770
Lung & bronchus	228,790	110,080	110,710	139,980	87,260	52,620
Other respiratory organs	5,760	4,000	1,760	780	480	300

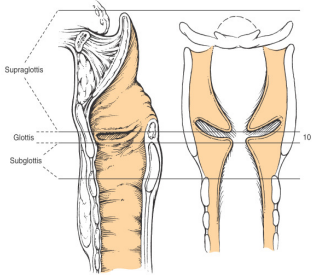
Keck Medical Center of USC Siegel, R., D. Naishadham, and A. Jemal. *Cancer statistics, 2013*. CA Cancer J Clin. 2013; 63(1): p. 11-30. 3

Risk Factors

- Smoking
- Alcohol
- Chronic GERD
- HPV 16 & 18
- Previous history of H&N cancer
- > 95% of larynx cancers are SCC

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Anatomy – Larynx Subsites



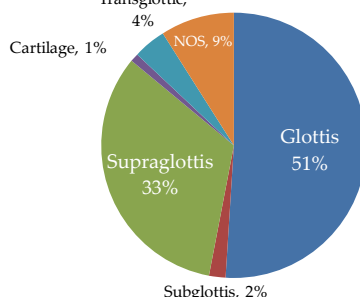
Anatomic Sites and Subsites of the Larynx

Site	Subsite
Supraglottis	Suprahoid epiglottis Infrahoid epiglottis Aryepiglottic folds, right and left (laryngeal surfaces) Arytenoids, right and left Ventricular bands, right and left
Glottis	True vocal cords, right and left (including the anterior and posterior commissures)
Subglottis	No separate subsites defined

From Greene F, Page D, Fleming I, et al. *AJCC Cancer Staging Manual*. 6th ed. New York: Springer; 2002.

Keck Medical Center of USC Weinstein, G.I., O., Rassekh C, Tufano R, Kokot N., *Conservation Laryngeal Surgery*, Cummings Otolaryngology, 5th edition(Chapter 110): p. 1539-1562. 5

Laryngeal SCC (N=158,426)



Subsite	Percentage
Glottis	51%
Supraglottis	33%
Subglottis	2%
Cartilage	1%
Transglottic	4%
NOS	9%

Keck Medical Center of USC Hoffman, H.T., et al. *Laryngeal cancer in the United States: changes in demographics, patterns of care, and survival*. Laryngoscope. 2006; 116(Pt 2 Suppl 111): p. 1-13. 6

Anatomy

Keck Medical Center of USC Reidenbach, M.M., *The paraglottic space and transglottic cancer: anatomical considerations.* Clin Anat, 1996, 9(4): p. 244-51. 7

Paraglottic Space

Supraglottic area

Portion of paraglottic space continuous with preepiglottic space

Paraglottic space

Reinke's space

Subglottic area

Cricoid area

Quadrangular membrane

Thyroid cartilage

Ventricular ligament

Ventricle

Vocal ligament

Conus elasticus

Cricoid cartilage

Keck Medical Center of USC Reidenbach, M.M., *The paraglottic space and transglottic cancer: anatomical considerations.* Clin Anat, 1996, 9(4): p. 244-51. 8

Paraglottic Space

Keck Medical Center of USC Kirchner, J.A., *Two hundred laryngeal cancers: patterns of growth and spread as seen in serial section.* Laryngoscope, 1977, 87(4 Pt 1): p. 474-82. 9

Preepiglottic space

Hyoid bone, Lig. hyoepiglott., Valleculla glossoepiglott., Membrana thyreoidea, Preepiglottic space, Fascia cervic. (Lam. superfic. et media), Lig. thyroepiglott., Cart. thyroidea, Plica vocalis, processus vocalis, Lig. cricothyroideum (Corticum), Cricoid arch, Gl. thyroidea (Isthmus), Trachea (Lumen), Lig. anulare, Cartilago epiglott., Epiglottis (Facies laryng.), Plica aryepiglottica, Tuberculum cuneiforme, Tuberculum cornicul., Plica (Incisura) interarytenoidea, M. arytenoideus, Cricoid lamina, Oesophagus-Muscularis, Trachea (Paries membranaceus)

Keck Medical Center of USC Weinstein, G.I., O., Rassekh C., Tufano R., Kokot N., *Conservation Laryngeal Surgery.* Cummings Otolaryngology, 5th edition(Chapter 110): p. 1539-1562. 10

Barriers to Spread

- Quadrangular Membrane
- Conus Elasticus
- Thyrohyoid membrane
- Anterior commissure tendon
- Hyoepiglottic ligament
- Cricothyroid ligament

Keck Medical Center of USC Weinstein, Laccourteyre, et al., "Organ Preservation Surgery For Laryngeal Cancer", Singular Publishing Group, San Diego, CA, 2000 11

Cricoarytenoid is the functional unit

- Arytenoid
- CA Joint
- Post CA muscle
- Lat CA muscle
- RLN
- SLN

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Staging – AJCC 8th ed.

	Supraglottis	Glottis
	Normal TVF mobility	
T1	Limited to one subsite of supraglottis	Limited to the vocal cord(s) T1a – limited to 1 TVF T1b –both TVF
T2	Tumor invades adjacent subsite, glottis or region outside the supraglottis (mucosa of BOT, vallecula, medial wall of pyriform sinus)	- Tumor extends to supraglottis and/or subglottis - Impaired mobility
T3	Tumor limited to larynx with: - vocal cord fixation - invasion of PCS, PES, inner cortex of thyroid cartilage - Postcricoid invasion	
T4a	Tumor invades through the thyroid cartilage and/or invades tissues beyond the larynx (e.g., trachea, soft tissues of neck including deep extrinsic muscle of the tongue, strap muscles, thyroid, or esophagus)	
T4b	Tumor invades prevertebral space, encases carotid artery, or invades mediastinal structures.	

Organ Preservation Options

- Endolaryngeal surgery
- Open Surgery
 - Vertical Partial Laryngectomy
 - Horizontal Partial Laryngectomy
 - Supracricoid Partial Laryngectomy
- Radiation
- Chemoradiation Currently the most utilized Strategy

Trends

All Cancer Survival

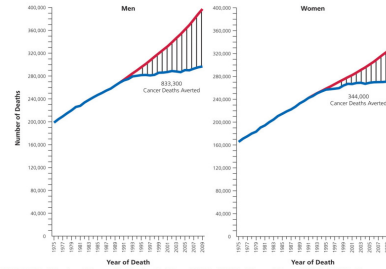


FIGURE 6. Total Number of Cancer Deaths Averted From 1991 to 2009 in Men and From 1992 to 2009 in Women. The blue line represents the actual number of cancer deaths observed in each year, and the red line represents the number of cancer deaths that would have been expected if cancer death rates had remained at their peak.

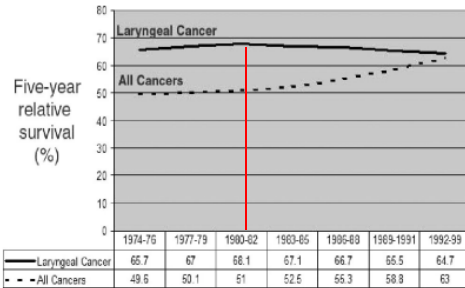
Laryngeal Cancer Survival Trend

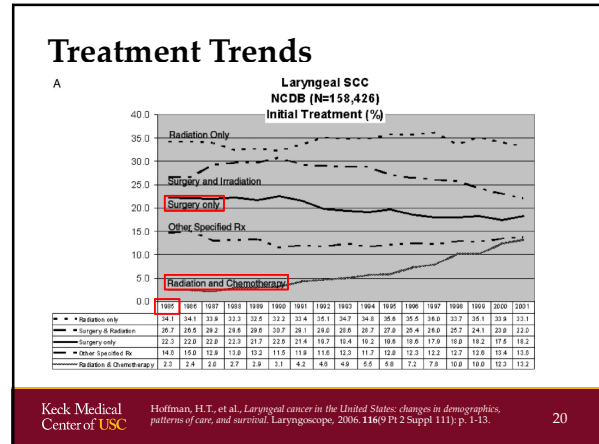
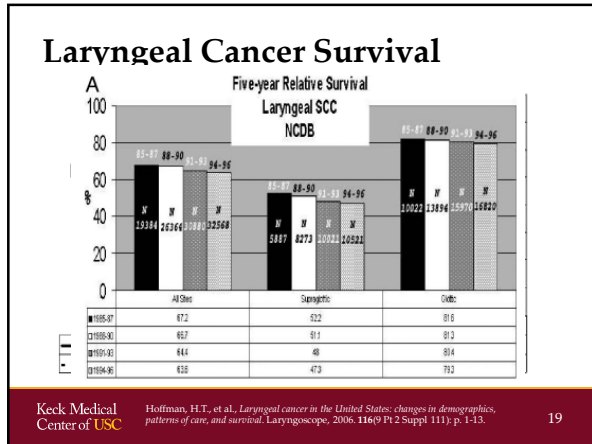
TABLE 12. Trends in 5-Year Relative Survival Rates* (%) by Race and Year of Diagnosis, United States, 1975 to 2008

	ALL RACES			WHITE			AFRICAN AMERICAN		
	1975 TO 1977	1987 TO 1989	2002 TO 2008	1975 TO 1977	1987 TO 1989	2002 TO 2008	1975 TO 1977	1987 TO 1989	2002 TO 2008
All sites	49	55	60	57	60	63	49	55	60
Brain & other nervous system	22	29	35	22	28	34	25	32	41
Breast (female)	75	84	90	76	85	92	62	71	78
Colon	51	61	65	51	61	66	45	53	55
Esophagus	5	10	19	4	11	21	3	7	14
Hodgkin lymphoma	72	79	87	72	80	88	70	77	82
Leukemia, all sites	26	27	27	26	27	27	26	27	27
Liver & intralobar bile duct	34	43	58	35	44	59	33	35	51
Liver & intrahepatic bile duct	3	5	10	3	6	16	2	3	11
Lung & bronchus	12	13	17	12	13	17	11	11	14
Melanoma of the skin	82	88	93	82	88	93	72	79	79
Myeloma	25	28	33	25	27	33	30	30	33
Non-Hodgkin lymphoma	47	51	57	47	52	57	48	46	53
Oral cavity & pharynx	53	54	61	54	56	63	38	34	45
Ovary	36	38	43	35	38	43	42	34	36
Pancreas	2	4	6	3	5	6	2	6	5
Prostate	68	83	90	69	85	90	61	72	80
Rectum	48	58	68	48	59	69	45	52	61
Stomach	15	25	28	14	19	27	16	19	28
Testis	83	95	96	83	96	97	73	88	89
Thyroid	92	95	98	92	94	98	90	92	96
Urinary bladder	73	79	80	74	80	81	50	63	62
Uterine cervix	69	75	80	70	75	79	65	57	63
Uterine corpus	67	83	83	68	84	85	60	57	63

*Survival rates are adjusted for normal life expectancy and are based on cases diagnosed in the Surveillance, Epidemiology, and End Results (SEER) 9 areas from 1975 to 1977, 1987 to 1989, and 2002 to 2008 and followed through 2009. The difference in rates between 1975 to 1977 and 2002 to 2008 is statistically significant (P < .05).

Laryngeal Cancer Survival





Surgery vs. Non-Surgery T3 Glottic

- Review of 487 pts from SEER Database

	Non-Surgical	Surgery	Surgery + adj tx
5yr OS	36%	41%	41%
Trach >1yr	32%	25%	
G-Tube >1yr	20.6%	18.5%	30.6%

- 14% of non-surgical pts required salvage TL

Keck Medical Center of USC Al-Gilani, Maha, Haughey Piccirillo, et al., *Surgical vs Nonsurgical treatment modalities for T3 Glottic Squamous cell carcinoma*. JAMA Otolaryngology, Oct 2006. 142(10), P949-946. 21

Chemoradiation

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Veteran's Affairs – 1991 NEJM

- TL + RT vs. Induction chemo + RT
- 64% larynx preservation
- 68% 2-yr survival in both groups
- Changed treatment paradigm from TL to chemoradiation

Keck Medical Center of USC Induction chemotherapy plus radiation compared with surgery plus radiation in patients with advanced laryngeal cancer. The Department of Veterans Affairs Laryngeal Cancer Study Group. N Engl J Med, 1991. 324(24): p. 1685-90. 23

ROG 91-11: 2003

- 3 Arms:
 - Induction Chemo + RT
 - Concurrent cisplatin + RT
 - RT alone
- Endpoint: Larynx Preservation

Keck Medical Center of USC Forastiere, A.A., et al., *Concurrent chemotherapy and radiotherapy for organ preservation in advanced laryngeal cancer*. N Engl J Med, 2003. 349(22): p. 2091-8. 24

RTOG 91-11: Patient Criteria

- Exclude T1 and large-volume T4 (thru cartilage or 1cm into BOT)
- Karnofsky > 60
- Stage III/IV supraglottis or glottis
- Failure was treated with TL

Keck Medical Center of USC
Forastiere, A.A., et al., *Concurrent chemotherapy and radiotherapy for organ preservation in advanced laryngeal cancer*. N Engl J Med. 2003; 349(22): p. 2091-8.
25

RTOG 91-11: Results

Treatment Group	0	1	2	3	4	5
Chemotherapy followed by radiotherapy	158	94	20			
Radiotherapy with concurrent cisplatin	154	107	28			
Radiotherapy alone	146	87	20			

Treatment Group	0	1	2	3	4	5
Chemotherapy followed by radiotherapy	147	89	19			
Radiotherapy with concurrent cisplatin	146	104	28			
Radiotherapy alone	127	78	19			

Keck Medical Center of USC
Forastiere, A.A., et al., *Concurrent chemotherapy and radiotherapy for organ preservation in advanced laryngeal cancer*. N Engl J Med. 2003; 349(22): p. 2091-8.
26

RTOG 91-11 – Results

- Laryngeal preservation in 88% w/ concurrent group
- 154/170 pts had complete response
- 45% laryngectomy free survival at 5 years
- 54% OS at 5 years
- Addition of Chemo improved DFS

Keck Medical Center of USC
Forastiere, A.A., et al., *Concurrent chemotherapy and radiotherapy for organ preservation in advanced laryngeal cancer*. N Engl J Med. 2003; 349(22): p. 2091-8.
27

A deeper look...

- No consideration for partial laryngectomy
- No surgical arm
- No reporting of G-tube or trach rates
- 23% only able to swallow soft foods or liquids
- 5% treatment related deaths
- Study results applied too broadly to all larynx tumors

Keck Medical Center of USC
Forastiere, A.A., et al., *Concurrent chemotherapy and radiotherapy for organ preservation in advanced laryngeal cancer*. N Engl J Med. 2003; 349(22): p. 2091-8.
28

A deeper look...

Characteristic	Cisplatin plus Fluorouracil Followed by Radiation (N=179)	Concurrent Cisplatin (N=172)	Radiotherapy Alone (N=173)
Tumor-node-metastasis stage —no. (%)			
T stage			
T2	39 (11)	21 (12)	20 (12)
T3 with fixed cord involvement	82 (45)	82 (48)	76 (44)
T4	54 (31)	52 (30)	41 (24)
N stage			
N0	87 (50)	86 (50)	87 (50)
N1	38 (21)	39 (23)	32 (19)
N2a	2 (1)	7 (4)	1 (0)
N2b	17 (10)	13 (8)	13 (8)
N2c	36 (20)	29 (17)	36 (21)
N3	3 (2)	4 (2)	2 (1)

- 70% T2-3 N0-1 (Conservation Surgery Candidates!)

Keck Medical Center of USC
Forastiere, A.A., et al., *Concurrent chemotherapy and radiotherapy for organ preservation in advanced laryngeal cancer*. N Engl J Med. 2003; 349(22): p. 2091-8.
29

Best Evidence for early laryngeal CA

- 1 RCT (1990 from Eastern Europe)
- T1/T2 - open Sx vs RT
- “High risk of bias”

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Warner, L., et al., *Radiotherapy versus open surgery versus endolaryngeal surgery (with or without laser) for early laryngeal squamous cell cancer*. Cochrane Database Syst Rev. 2014; 12: p. Cd002027.
30

Best Evidence for early laryngeal CA

Five-year Overall Survival (n=234)			Five-year Disease Free Survival (n=234)		
	Open Surgery	Radiation		Open Surgery	Radiation
T1	100%	91.7%	T1	100%	71.1%
T2	97.4%	88.8%	T2	78.7%*	60.1%*

Differences were non-significant * Differences were significant

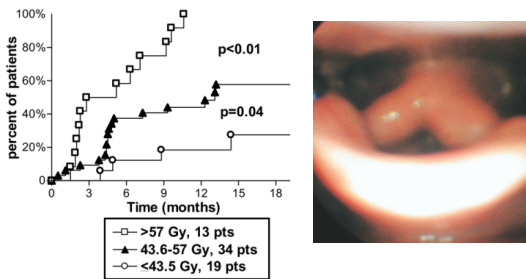


Summary of main results

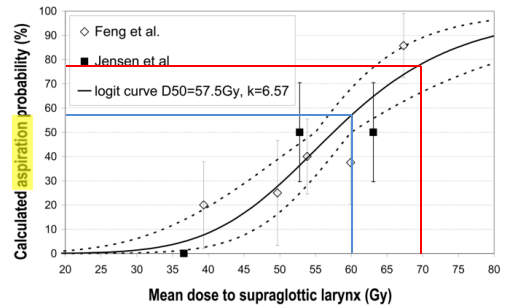
There is no good evidence available from randomised controlled trials to guide treatment choice for patients with early-stage glottic cancer.

Radiation Toxicity

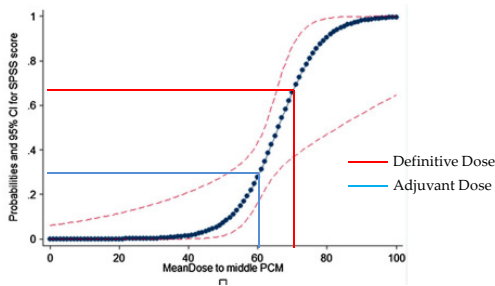
Radiotherapy Toxicity - Edema



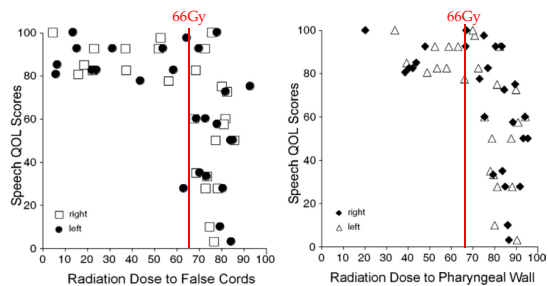
Radiotherapy Toxicity



Radiotherapy Toxicity - Dysphagia



Radiotherapy Toxicity - Speech



Carotid: IMRT vs. Opposing Fields

Conventional RT IMRT

Keck Medical Center of USC Samuels, Michael, Laura M Freedman, Elsayyad Nagy. "IMRT for early glottis cancer: transition to a new standard of care?" Future oncology (2016) 12(22), 2615-2630. 37

Radiotherapy Toxicity – Carotid dz

- Intimal thickening/Stenosis if >35 Gy
- 5.1 RR of stroke at median 10.9 years for early larynx scc
- ~6.5% risk of any stroke
- 1.3% risk of fatal stroke
- 12% cumulative risk of stroke after neck RT after 15 years

Keck Medical Center of USC Samuels, Michael, Laura M Freedman, Elsayyad Nagy. "IMRT for early glottis cancer: transition to a new standard of care?" Future oncology (2016) 12(22), 2615-2630. 38

IMRT vs. Opposing Fields

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Radiation First or Surgery First?

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TLM vs. RT: Early Glottic Cancer

Study	TLM		RT		Risk difference M-H, Fixed, CI _{95%}	Risk difference M-H, Fixed, CI _{95%}
	n	Total	n	Total		
Thurnher (2008)	20	81	34	108	18.0%	-0.07 [-0.20, 0.06]
Sjogren (2008)	12	73	14	70	13.9%	-0.04 [-0.16, 0.09]
Schrijvers (2009)	4	49	9	51	9.7%	-0.09 [-0.22, 0.03]
Remmelts (2013)	7	50	6	54	10.1%	0.03 [-0.10, 0.16]
Milovanovic (2013)	2	72	3	75	14.3%	-0.01 [-0.07, 0.05]
Mahler (2010)	41	188	46	163	34.0%	-0.06 [-0.15, 0.03]
Total (CI_{95%})		513		521	100.0%	-0.05 [-0.09, -0.00]
Total of events	86		112			
Heterogeneity: Chi ² = 3.52, df = 5 (P = 0.62); I ² = 0%						
Test for overall effect: Z = 1.97 (P = 0.05)						

Figure 2. Forest plot chart comparing microsurgery to radiotherapy in relation to overall survival.

Keck Medical Center of USC Guimaraes AV et al. "Comparison between transoral laser surgery and radiotherapy in the treatment of early glottis cancer: a systematic review and meta-analysis. Scientific Reports (2018) 8:11900. 41

RT vs Surgery for T1/T2 of Glottis

- 356 pts retrospectively reviewed
- T1 – 88% // T2 – 12%
- 5 yr survival – 84% (surgery) vs 78% (RT)
- Larynx preserved in 92% of surgery but 81% of RT
- **Conclusions:** survival is similar however more recurrences with RT. Voice with RT is better

Keck Medical Center of USC Ton-Van, J., et al., "Comparison of surgery and radiotherapy in T1 and T2 glottic carcinomas. Am J Surg, 1991, 162(4): p. 337-40. 42

Salvage after RT Failure

- 105 pts w/ RT failure of T1 (63%) or T2 (37%) lesion

69.5% Total Laryngectomy
12.3% -----Recurrence-----

30.5% Conservation Surgery
15.6%

1) Conservation surgery is oncologic
2) Cannot rely on surgical salvage for organ preservation!

Keck Medical Center of USC Hobinger, F.C., et al., Conservation laryngeal surgery versus total laryngectomy for radiation failure in laryngeal cancer. Head Neck, 2006, 28(9): p. 779-84. 43



Supracricoid Partial Laryngectomy

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History of Procedure

- 1959 – Dr. Majer, Rieder (Vienna)
- 1970’s – Dr. Laccourreye, Piquet (Paris)
- 1990’s - English literature: Dr. Laccourreye, Weinstein
- Current – Series publications

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SCPL Technique

- Resection involves:
 - Both TVF
 - Both FVF
 - PGS
 - Thyroid Cartilage
 - +/- Epiglottis/PES
 - +/- One arytenoid

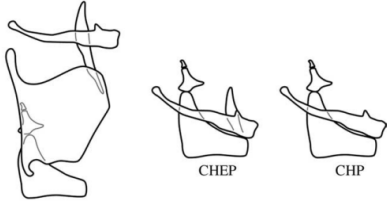


Posterior Resection specimen

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Reconstruction

- Cricohyoidopexy (CHP)
- Cricohyoidepiglottopexy (CHEP)



Keck Medical Center of USC Hobinger, F.C., et al., Technical refinements in the supracricoid partial laryngectomy to optimize functional outcomes. J Am Coll Surg, 2005, 201(5): p. 809-20. 47
Lai, S.Y., Laccourroye, O., Weinstein, G.S., Supracricoid Partial Laryngectomy with Cricohyoidepiglottopexy. Operative techniques in Otolaryngology - Head and Neck Surgery, 2003, 14(3): p. 34-39.


Preop Evaluation

- Ensure good 3D tumor mapping
- Pulmonary function
- GERD treatment
- Consent for total laryngectomy
- Rigorous swallow rehab
- Consider G-tube if prior RT
- T1b-T4 tumors

Keck Medical Center of USC Hobinger, F.C., et al., Technical refinements in the supracricoid partial laryngectomy to optimize functional outcomes. J Am Coll Surg, 2005, 201(5): p. 809-20. 48

Contraindications

- Arytenoid joint fixation
- Interarytenoid involvement
- Cricoid cartilage invasion - Subglottic extension
- Hyoid invasion - major preepiglottic space invasion with clinical evidence of bulging beneath the vallecula mucosa and/or extension through the thyrohyoid membranes
- Extralaryngeal extension

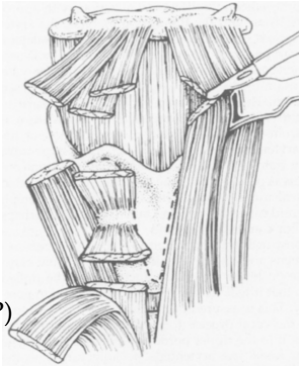


CHP

Hobinger, F.C., et al. Technical refinements in the supracricoid partial laryngectomy to optimize functional outcomes. J Am Coll Surg, 2003, 201(5): p. 809-20.
Lai, S.Y., Laccourreye, O., Weinstein, G.S. Supracricoid Partial Laryngectomy with Cricohyoidpigioltopexy. Operative techniques in Otolaryngology - Head and Neck Surgery, 2003, 14(1): p. 34-39.

CHP

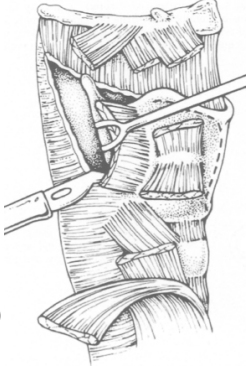
- Expose Field
- Cut Inf Constrictor
- Disarticulate Joint
- Enter Airway
- Tumor Resection
- Crack Cartilage
- Recon (CHP vs CHEP)



Sewell, D. Supracricoid Partial Laryngectomy with Cricohyoidpexy. Operative techniques in Otolaryngology - Head and Neck Surgery, 2003, 14(1): p. 27-33.
Lai, S.Y., Laccourreye, O., Weinstein, G.S. Supracricoid Partial Laryngectomy with Cricohyoidpigioltopexy. Operative techniques in Otolaryngology - Head and Neck Surgery, 2003, 14(1): p. 34-39.

CHP

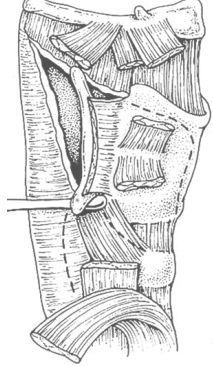
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Sewell, D. Supracricoid Partial Laryngectomy with Cricohyoidpexy. Operative techniques in Otolaryngology - Head and Neck Surgery, 2003, 14(1): p. 27-33.
Lai, S.Y., Laccourreye, O., Weinstein, G.S. Supracricoid Partial Laryngectomy with Cricohyoidpigioltopexy. Operative techniques in Otolaryngology - Head and Neck Surgery, 2003, 14(1): p. 34-39.

CHP

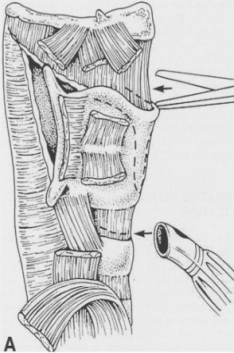
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- Crack Cartilage
- Recon (CHP vs CHEP)



Sewell, D. Supracricoid Partial Laryngectomy with Cricohyoidpexy. Operative techniques in Otolaryngology - Head and Neck Surgery, 2003, 14(1): p. 27-33.
Lai, S.Y., Laccourreye, O., Weinstein, G.S. Supracricoid Partial Laryngectomy with Cricohyoidpigioltopexy. Operative techniques in Otolaryngology - Head and Neck Surgery, 2003, 14(1): p. 34-39.

CHP


- Expose Field
- Cut Inf Constrictor
- Disarticulate Joint
- Enter Airway
- Tumor Resection
- Crack Cartilage
- Recon (CHP vs CHEP)



Sewell, D. Supracricoid Partial Laryngectomy with Cricohyoidpexy. Operative techniques in Otolaryngology - Head and Neck Surgery, 2003, 14(1): p. 27-33.
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Keck Medical Center of USC Sewell, D., *Supracricoid Partial Laryngectomy with Cricohyaloidopexy*. Operative techniques in Otolaryngology - Head and Neck Surgery, 2003, 14(1): p. 27-33.
Lai, S.Y., Laccourney, O., Weinstein, G.S., *Supracricoid Partial Laryngectomy with Cricohyaloidopexy*. Operative techniques in Otolaryngology - Head and Neck Surgery, 2003, 14(1): p. 34-39. 55

Specimen

Anterior Posterior

Keck Medical Center of USC Holsinger, F.C., et al., *Supracricoid Partial Laryngectomy with Cricohyaloidopexy*. Surgical Technique Illustrated in the Anatomy Lab. Head Neck, 2014. 56

Defect

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CHP

- Expose Field
- Cut Inf Constrictor
- Disarticulate Joint
- Expose Larynx
- Tumor Resection
- Crack Cartilage
- Recon (CHP vs CHEP)

Keck Medical Center of USC Weinstein, Laccourney, et al., "Organ Preservation Surgery For Laryngeal Cancer". Singular Publishing Group, San Diego, CA, 2000. 58

CHP

- Expose Field
- Cut Inf Constrictor
- Disarticulate Joint
- Expose Larynx
- Tumor Resection
- Crack Cartilage
- Recon (CHP vs CHEP)

Keck Medical Center of USC Sewell, D., *Supracricoid Partial Laryngectomy with Cricohyaloidopexy*. Operative techniques in Otolaryngology - Head and Neck Surgery, 2003, 14(1): p. 27-33.
Lai, S.Y., Laccourney, O., Weinstein, G.S., *Supracricoid Partial Laryngectomy with Cricohyaloidopexy*. Operative techniques in Otolaryngology - Head and Neck Surgery, 2003, 14(1): p. 34-39. 59

Recon

- Expose Field
- Cut Inf Constrictor
- Disarticulate Joint
- Enter Airway
- Tumor Resection
- Crack Cartilage
- Recon (CHP vs CHEP)

CHP CHEP


Keck Medical Center of USC Sewell, D., *Supracricoid Partial Laryngectomy with Cricohyaloidopexy*. Operative techniques in Otolaryngology - Head and Neck Surgery, 2003, 14(1): p. 27-33.
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Postop Management

- **POD#0:**
 - Deflate trach cuff
 - Antibiotics for aspiration
 - Oral hygiene
 - Anti-reflux
- **POD#1:**
 - Chest PT
 - Ambulation
 - Speech and swallow therapy
- **POD#3:**
 - Change trach
- **POD#5: Discharge Home**
- **First Clinic Visit:**
 - Downsize and cap trach at night
- **Second Clinic Visit:**
 - Cap trach x 24 then decannulate
- **Third Clinic Visit:**
 - Decannulate trach
 - Remove NG after trach decannulation

Keck Medical Center of USC Holsinger, F.C., et al., Technical refinements in the supracricoid partial laryngectomy to optimize functional outcomes. J Am Coll Surg. 2005; 201(5): p. 809-20. 61

Flexible Laryngoscopy - CHP



Keck Medical Center of USC <https://www.youtube.com/watch?v=VSIQe1ejpqQ> 62


Complications

- Aspiration pneumonia – 8.5%
- Wound infection – 4.2%
- Pexis rupture – 1%
- Laryngocele – 3.1%
- Chondroradionecrosis – 0.5%
- Laryngeal Stenosis – 0.5- 3.7%
- OSA

Keck Medical Center of USC Naudo, P., et al., Complications and functional outcome after supracricoid partial laryngectomy with cricohyoidoepiglottomy. Otolaryngol Head Neck Surg. 1998; 118(1): p. 124-9. 63

Management of Local Failure

- 15/322 (4.7%) w/ local recurrence
- Tx:
 - TL (11/12)
 - CO2 laser arytenoidectomy
- 80% local control



Keck Medical Center of USC Laccourreye, O., et al., Local failure after supracricoid partial laryngectomy: symptoms, management, and outcome. Laryngoscope. 1998; 108(3): p. 339-44. 64

Outcomes

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Expected Outcomes

- 1) Temporary dysphagia
 - Swallowing returns in 2-3 wks (more if elderly or radiation history)
- 2) Temporary trach
- 3) Permanent hoarseness
 - Less efficient in range, jitter, shimmer, rate

- Weighted LC - 94% (98% if primary)

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Functional Outcomes (N=190)

- Trach removal – 9 days
- NG removal – 16 days
- Mortality – 1%
- 98.4% trach and Gtube free by 1st year
- 23.4% w/ temporary aspiration

Outcomes- Elderly

- N=69 pts > 65 yo
- 0 periop deaths
- 1 aspiration pna death 3 yrs postop
- Laryngeal Stenosis 4.3%
- Permanent G-tube 1.4%
 - Reduced by piriform resuspension (p=0.01)
- 93.0% 5 yr local control (salvaged w/ TL)

SCPL for radiation failure – meta analysis

- 11 papers – 251 patients
- rT2, AC extension, rT3
 - 2 year LC - 92%
 - 5 year OS – 79%
 - Larynx preservation rate – 85.2%
 - Trach Decannulation rate - 92.1%
 - PEG dependence – 3.5%

SCPL Outcomes – N=96

- Oncologic

	5 Yr LP	5 Yr LC
No Prior RT	95%	98%
T2 n=23	100%	100%
T3 n=28	91%	96%
RT Failure	89%	89%
T1 n= 23	91%	91%
T2 n=12	78%	78%
T3 n=6	100%	100%

SCPL Outcomes – N=96

- Oncologic
- Functional

	5 Yr LP	5 Yr LC
No Prior RT	95%	98%
T2 n=23	100%	100%
T3 n=28	91%	96%
RT Failure	89%	89%
T1 n= 23	91%	91%
T2 n=12	78%	78%
T3 n=6	100%	100%

Trach dependence n=6	10% (mean 43 days)
G tube Dependence	8% (mean 74 days)
Complications	19%
Deaths	N=1 (cirrhosis)
Ruptured Pexis	N=2
Pna	N=4
Wound Infection	N=4

SCPL Outcomes – N=96

- Oncologic
- Radiation trials

	5 Yr LP	5 Yr LC
No Prior RT (n=54)	95%	98%
T2	100%	100%
T3	91%	96%
RT Failure (n=42)	89%	89%
T1	91%	91%
T2	78%	78%
T3	100%	100%

MEDICAL Treatments	5 Yr LC
RT0G 91-11	71.1% 45% LFS
RT T1	81-94%
RT T2	50-85%

SCPL Outcomes – N=96

-

ChemoRT		SCPL	
Complications (Grade 3-5)	47%	Trach dependence	10% (mean 43 days)
Deaths	6.9%	G tube Dependence	8% (mean 74 days)
Infection	4%	Complications	19%
Mucositis	43%	Deaths	N=1
Dysphagia	23%	Ruptured Pexis	N=2
NPO	3%	Pna	N=4
		Wound Infection	N=4

Keck Medical Center of USC Sperry, S.M., et al., Supracricoid partial laryngectomy for primary and recurrent laryngeal cancer. JAMA Otolaryngol Head Neck Surg. 2013. 139(11): p. 1226-35. 73

Should we change our treatment Strategy?

- Oncologic
- Functional

ChemoRT		SCPL	
Complications (Grade 3-5)	47%	Trach dependence	10% (mean 43 days)
Deaths	6.9%	G tube Dependence	8% (mean 74 days)
Infection	4%	Complications	19%
Mucositis	43%	Deaths	N=1
Dysphagia	23%	Ruptured Pexis	N=2
NPO	3%	Pna	N=4
		Wound Infection	N=4

Keck Medical Center of USC Sperry, S.M., et al., Supracricoid partial laryngectomy for primary and recurrent laryngeal cancer. JAMA Otolaryngol Head Neck Surg. 2013. 139(11): p. 1226-35. 74

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Thank you



Questions?

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