The International Federation of Head and Neck Oncologic Societies

Current Concepts in Head and Neck Surgery and Oncology 2017

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of Head and Neck Oncologic Societies
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Larynx Preservation: Surgical Options

Dr. Patrick Gullane

Contemporary Surgical Management of Carcinoma of the Larynx

"Cancer is a terrible disease, but I do not accept that the surgeon's scalpel may be more destructive than the disease itself. The war against the larynx must stop, since its removal is unnecessary and ineffective in many cases. To take away the disease without excising a healthy glottis to make an effort to preserve the function of the organ, to strive not to return a disabled person to the society: that is my motto" *Alonso-1954*

Goals:

Achieve Cure

Laryngeal Preservation

Improved Quality of Life

2017 International Federation of Head and Neck Oncologic Societies

Purpose of the presentation

Review the Management of Early Glottic Cancer

- Radiotherapy vs Transoral laser (TOL)

Review the Option of Horizontal Partial Laryngectomy in Intermediate Staged Larynx Carcinoma

Review the management of recurrent glottic carcinoma following radiation failure

2017

Fundamental Principles Primary issues

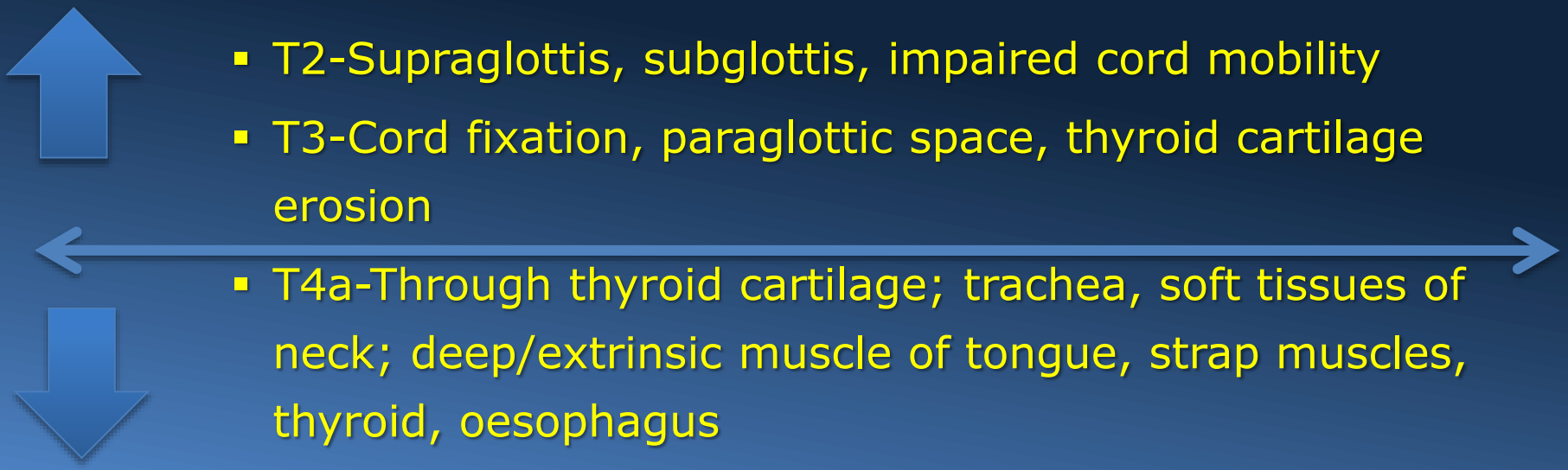
- Local and regional control of disease
- Preservation of functional speech
- Preservation of swallowing function
- QOL

Fundamental Principles Secondary issues

- Voice quality
- Swallowing efficacy
- Duration and Morbidity of Treatment
- Cost of Treatment

Staging of Glottic Cancer

- Glottis
  - T1-Limited to vocal cord(s), normal mobility one cord or both cords
  - T2-Supraglottis, subglottis, impaired cord mobility
  - T3-Cord fixation, paraglottic space, thyroid cartilage erosion
  - T4a-Through thyroid cartilage; trachea, soft tissues of neck; deep/extrinsic muscle of tongue, strap muscles, thyroid, oesophagus
  - T4b-Prevertebral space, mediastinal structures, carotid artery



Management Options in Laryngeal Carcinoma

- Early stages
  - laser CO^2 endoscopic surgery
  - open partial surgery
  - radiation therapy
- 2. Moderately advanced and advanced stages
  - laser CO^2 endoscopic surgery
  - supracricoid partial laryngectomies
  - partial laryngopharyngectomies
  - total laryngectomy
  - Altered fractionation Radiation Therapy
  - Concomitant Chemoradiatiion
  - Neoadjuvant

From Lefebvre

Treatment of choice

T1

Glottic cancer

Treatment of choice

Treatment of choice

Radiation Treatment Early Glottic Carcinoma

Study	Number of Subjects	Stages	Overall Survival	Local Control
Fletcher[22]	330	T1,T2	-	80%
Horiot[24]	415	Tis,T1a,T1b	-	83%
Le[26]	398	T1,T2	43%	80%
Wang[28]	902	T1,T2	95%	88%

Int. J. Radiation Oncology Biol. Phys., Vol. 78, No. 2, pp. 461–466, 2010

0360-3016/$–see front matter

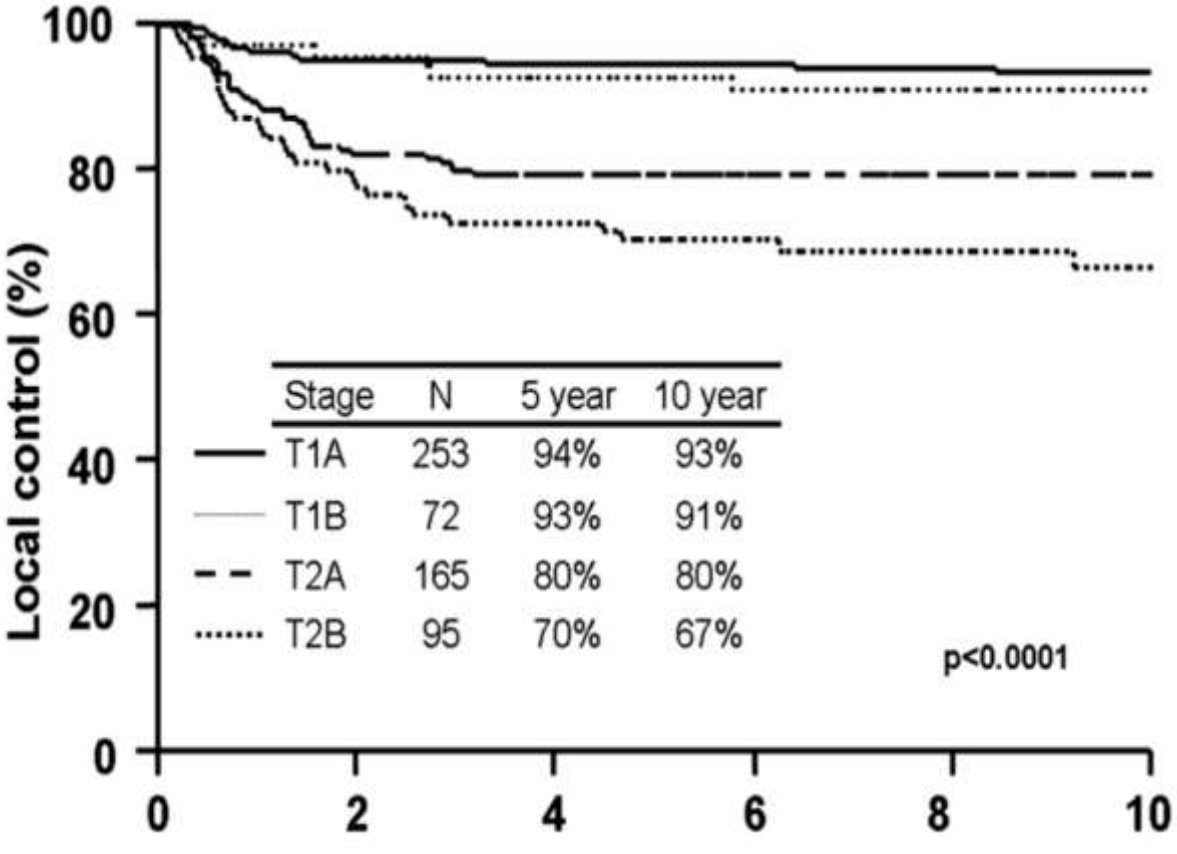
ELSEVIER

doi:10.1016/j.ijrobp.2009.08.066

CLINICAL INVESTIGATION **Head and Neck**

T1N0 TO T2N0 SQUAMOUS CELL CARCINOMA OF THE GLOTTIC LARYNX TREATED WITH DEFINITIVE RADIOTHERAPY

Bhishamjit S. Chera, M.D., Robert J. Amdur, M.D., Christopher G. Morris, M.S., Jessica M. Kirwan, M.A., and William M. Mendenhall, M.D.



Transoral laser excision in early glottic carcinoma

Study	Number of Subjects	Stages	Overall Survival	Local Control
Gallo[31]	151	Tis,T1,T2	94%	94%
Eckel[32]	285	Tis,T1,T2	70%	85%
Steiner[30]	263	T1a,T1b,T2	76%	88%

ORIGINAL ARTICLE

TRANSORAL LASER SURGERY VERSUS RADIOTHERAPY: SYSTEMATIC REVIEW AND META-ANALYSIS FOR TREATMENT OPTIONS OF T1a GLOTTIC CANCER

Yasin Abdurehim, MD, Zhang Hua, PhD, Yalkun Yasin, Ayihen Xukurhan, Ilham Imam, Fan Yuqin

Department of Otorhinolaryngology, First Teaching Hospital of Xinjiang Medical University, Urumqi, China.
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Local Control

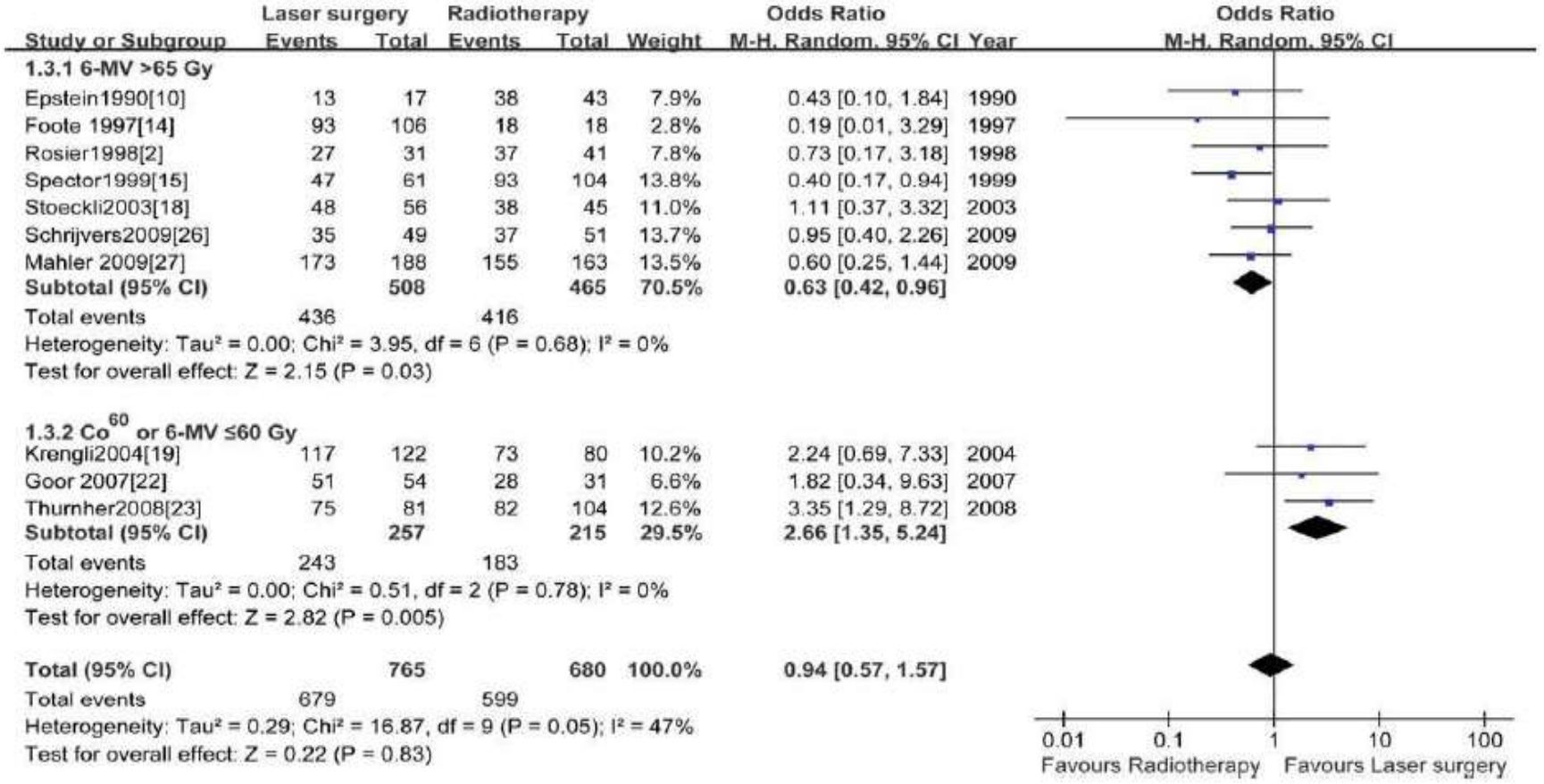
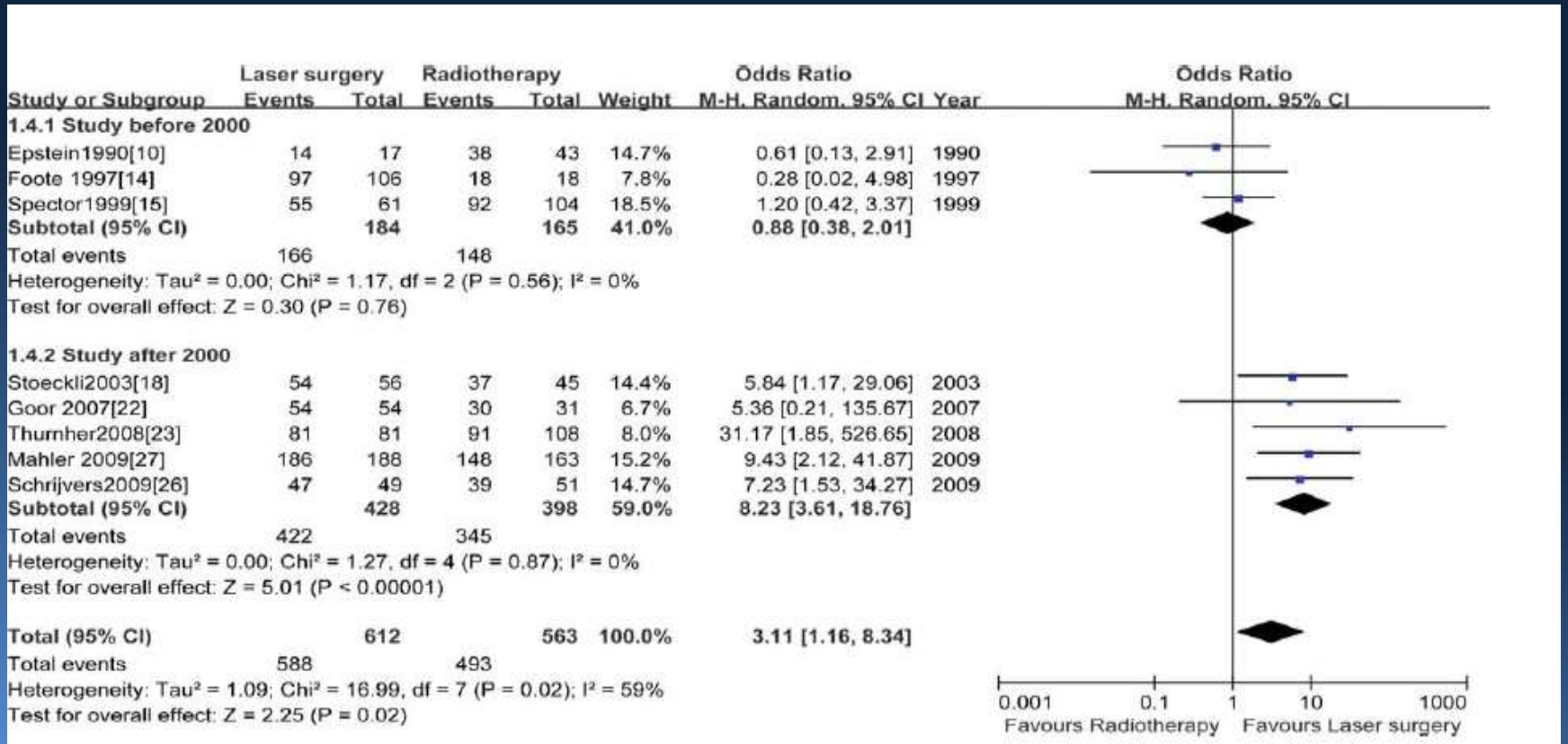


FIGURE 4. Forest plot of comparison between TLS and RT with respect to local control. [Color figure can be viewed in the online issue, which is available at wileyonlinelibrary.com.]

Larynx Preservation



URE 5. Forest plot of comparison between TLS and RT with respect to larynx preservation. [Color figure can be viewed in the ine issue, which is available at wileyonlinelibrary.com.]

Rationale for Transoral Laser for Early Glottic Carcinoma

i. Cost
   - Outpatient surgery vs 4-6 weeks of Tx
   - In North America Laser surgery more cost effective

ii. Voice Results?
   - Dependant on extent of resection

iii. Local Control equal or superior except
   - Limited access
   - Anterior commissure
   - Paraglottic space
   - Multifocal disease

Management Options in Laryngeal Carcinoma

- Early stages
  - laser CO^2 endoscopic surgery
  - open partial surgery
  - radiation therapy
- 2. Moderately advanced and advanced stages
  - laser CO^2 endoscopic surgery
  - Horizontal Partial Laryngectomy
  - partial laryngopharyngectomies
  - total laryngectomy
  - Altered fractionation Radiation Therapy
  - Concomitant Chemoradiation
  - Neoadjuvant

Advanced Laryngeal Cancer Many T2,T3,T4

Vocal fold mobility/ fixation T2/T3

PGS/PE S Invasion T3

Minor Cartilage Erosion T3

Small But Beyond the Larynx T4a

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Partial Horizontal Laryngectomy

Open partial horizontal laryngectomies: a proposal for classification by the working committee on nomenclature of the European Laryngological Society

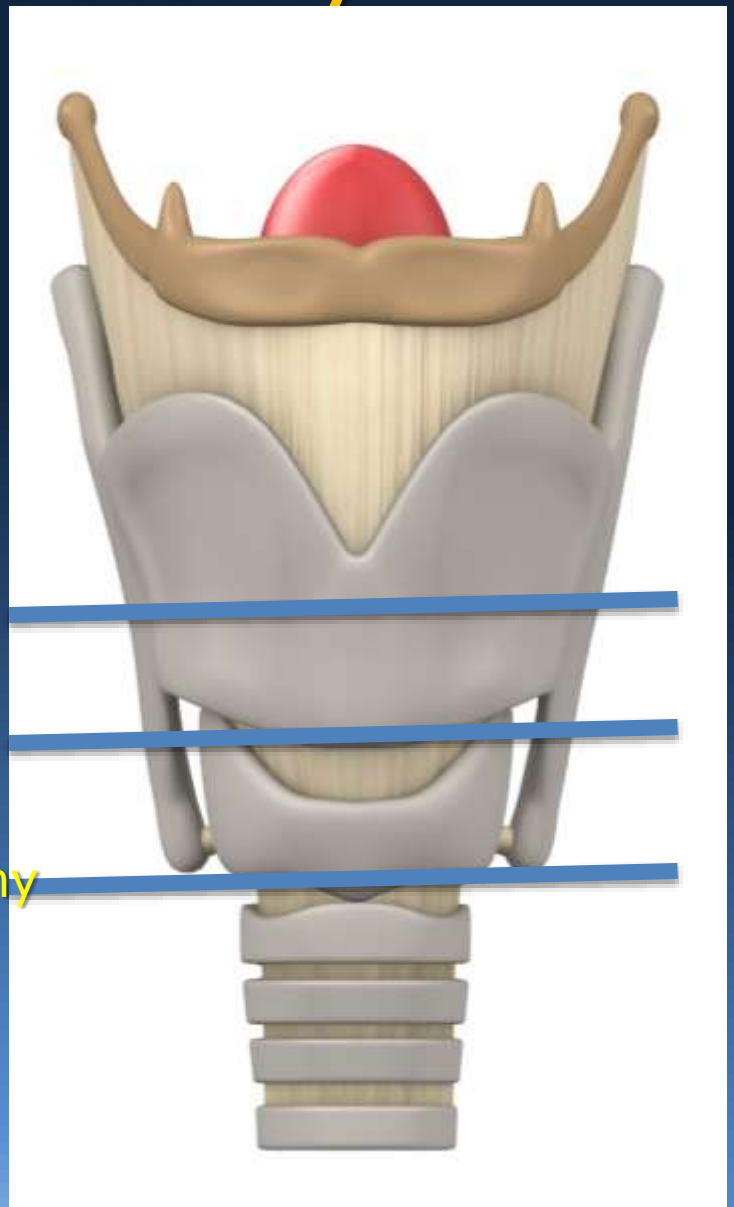
G. Succo · G. Peretti · C. Piazza · M. Remacle · H. E. Eckel · D. Chevalier · R. Simo · A. G. Hantzakos · G. Rizzotto · M. Lucioni · E. Crosetti · A. R. Antonelli

Open Horizontal Partial Laryngectomy

Type I Supraglottic Laryngectomy

Type II- Supracricoid Laryngectomy

Type III- Supratracheal Laryngectomy



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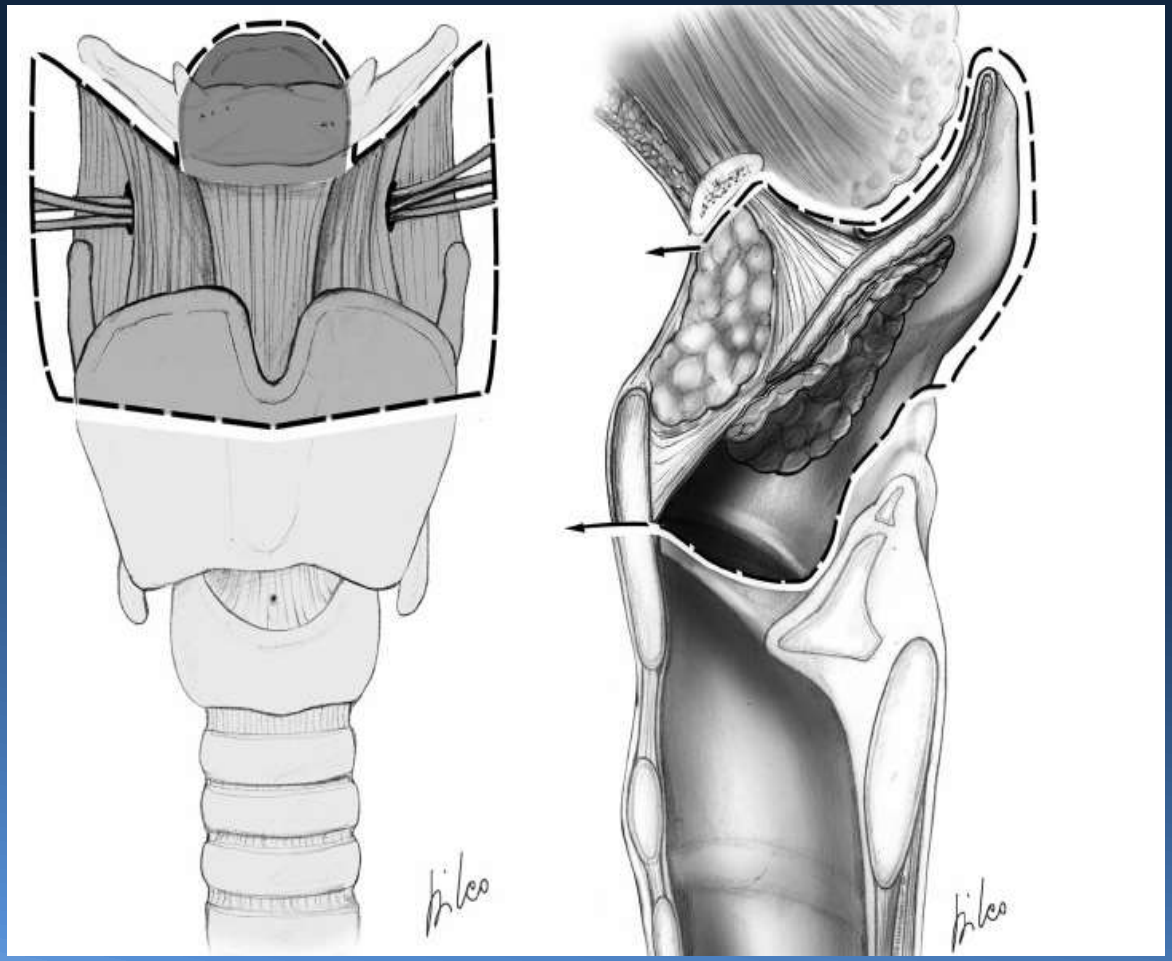
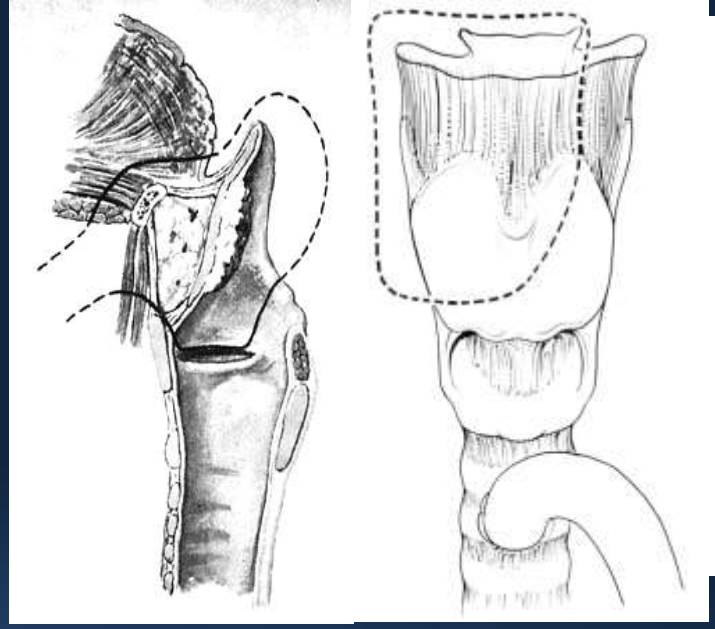
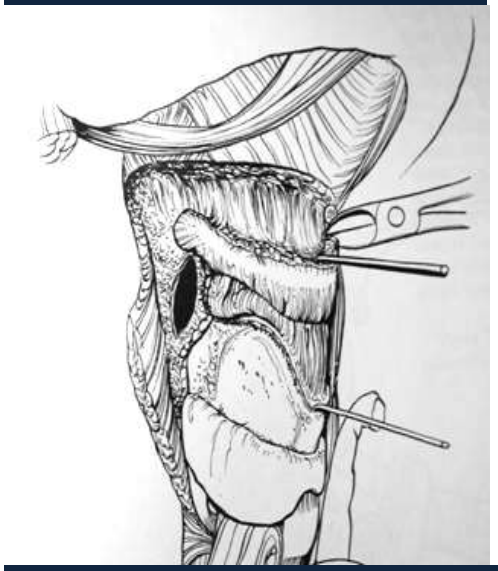
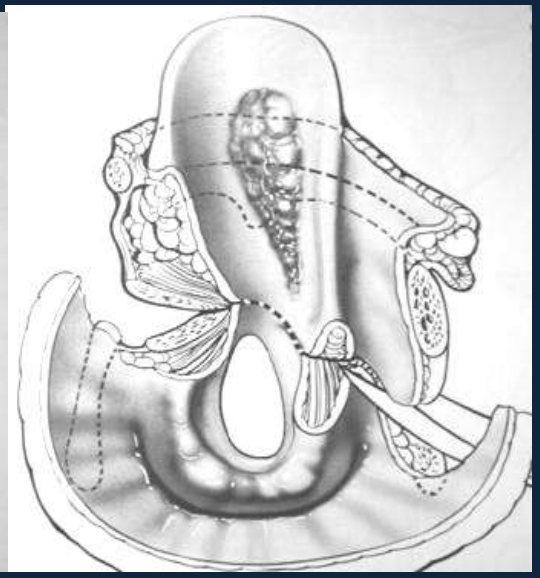
Type I Horizontal Supraglottic

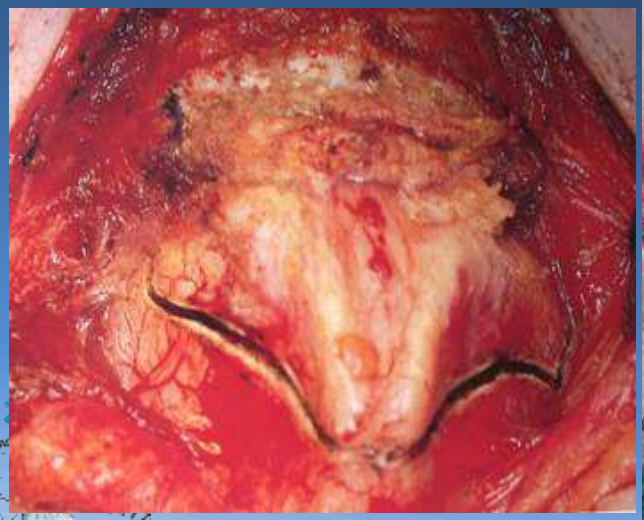


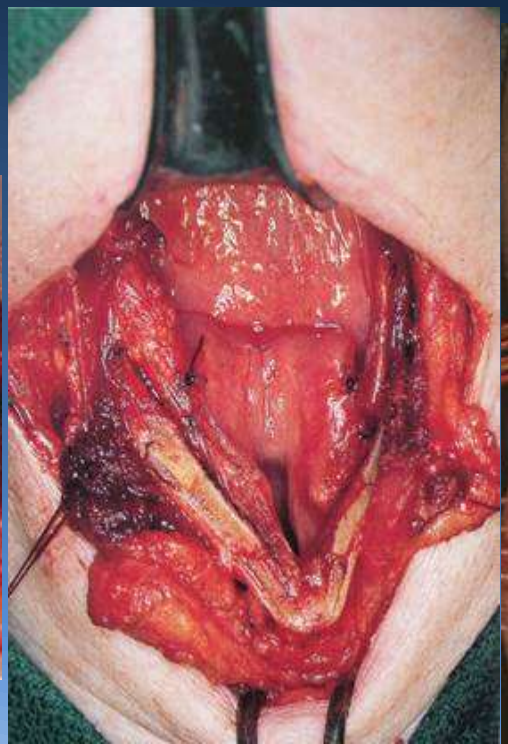
From Succo

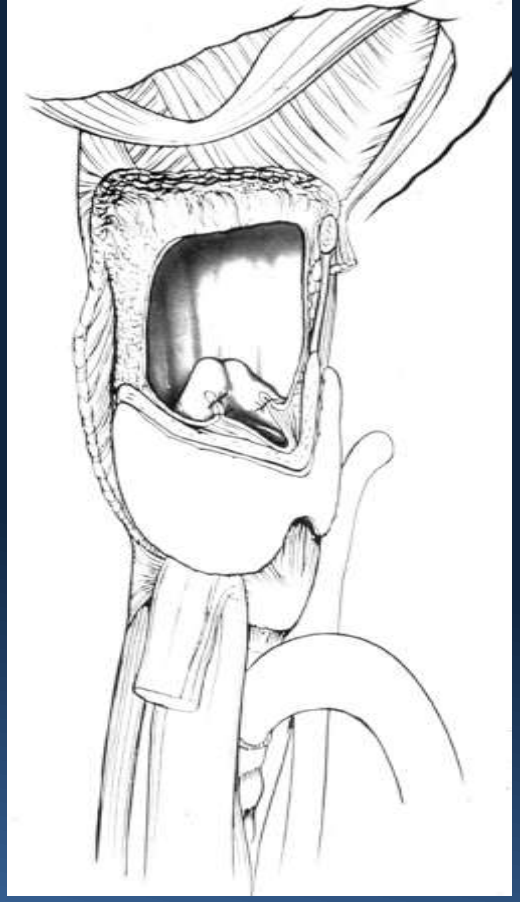


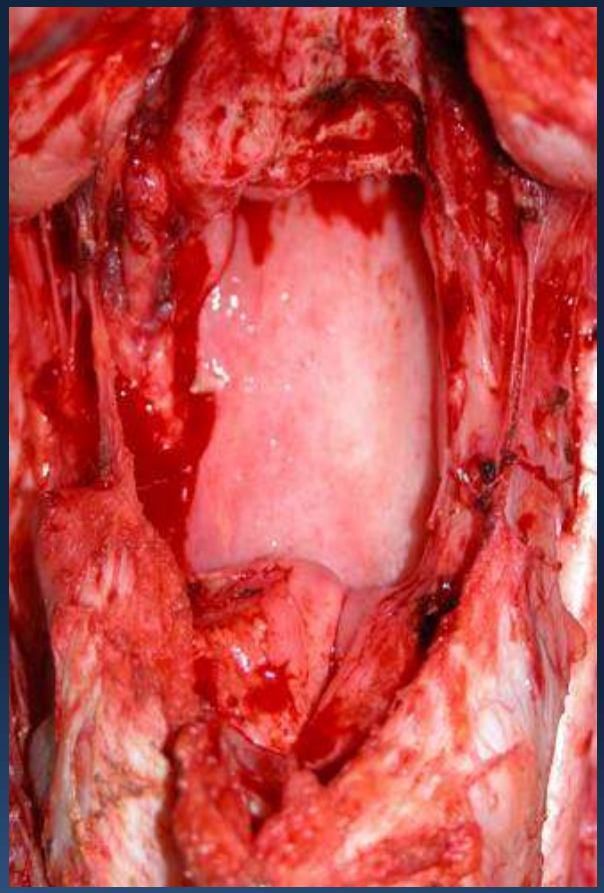


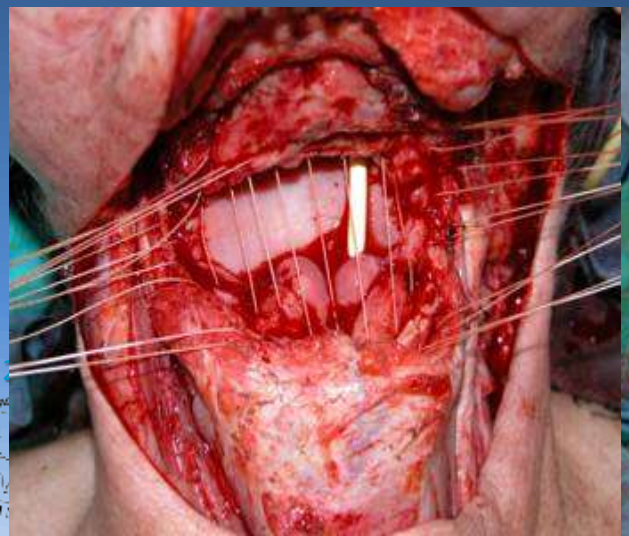


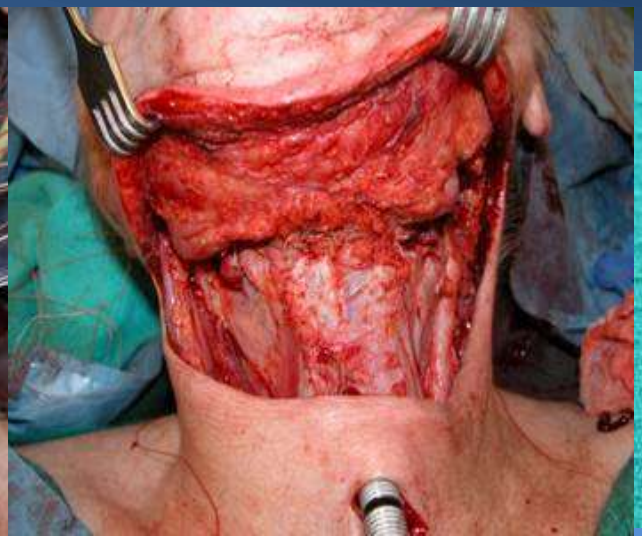


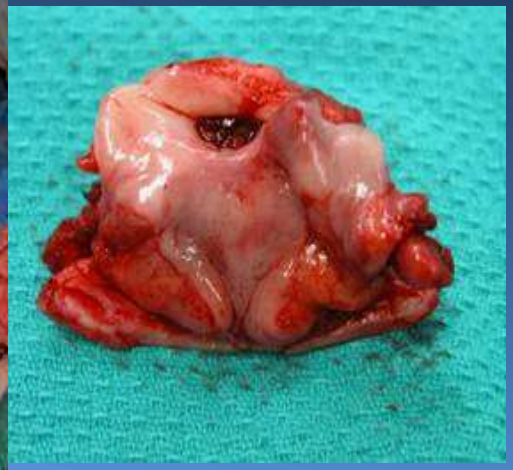












Supraglottic Laryngectomy

Indications

- ✓ Supraglottic T2-T3 limited to the upper medial wall of the piriform sinus or mucosa of the vallecula
- ✓ Supraglottic T3 with PES involvement

Contraindications

- ✓ Invasion of cricoid/thyroid cartilage
- ✓ Bilateral Arytenoid
- ✓ Invasion of PC/AC
- ✓ Vocal Cord Fixation
- ✓ Base of tongue involvement

Type I Horizontal-Disease Outcome

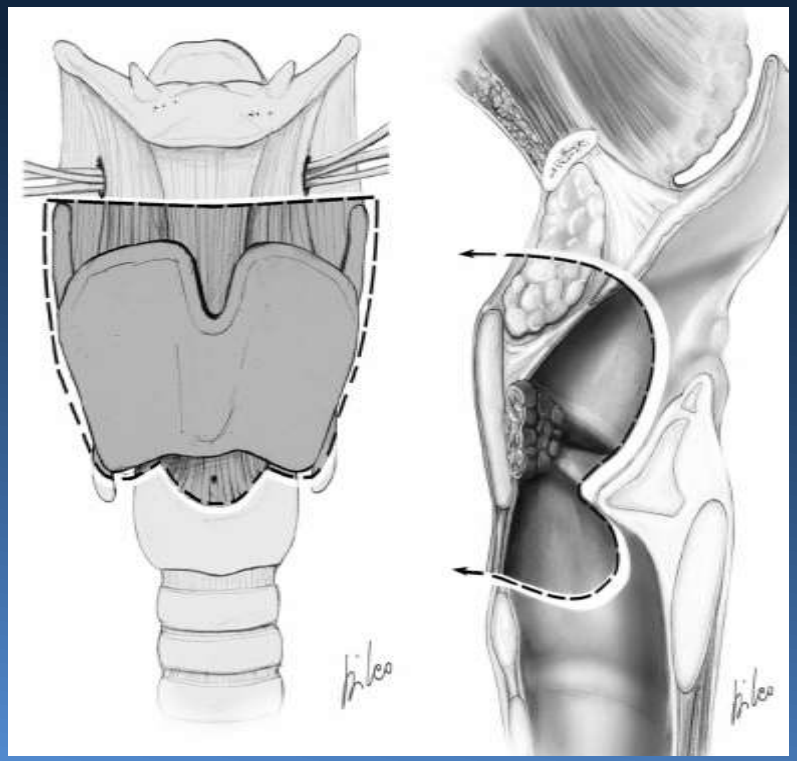
Author	T- staging	OS Survival(5yr)	Local Control(5yr)
Spriano 1997	T1-2 (54)	82%	96%
Isaacs 1998	T1 (9) T2(24) T3 (9)	-	100% 78% 72%
Bron 2005	T1 (16) T2 (46) T3 (13)	-	92%

Type I Horizontal-Functional Outcome

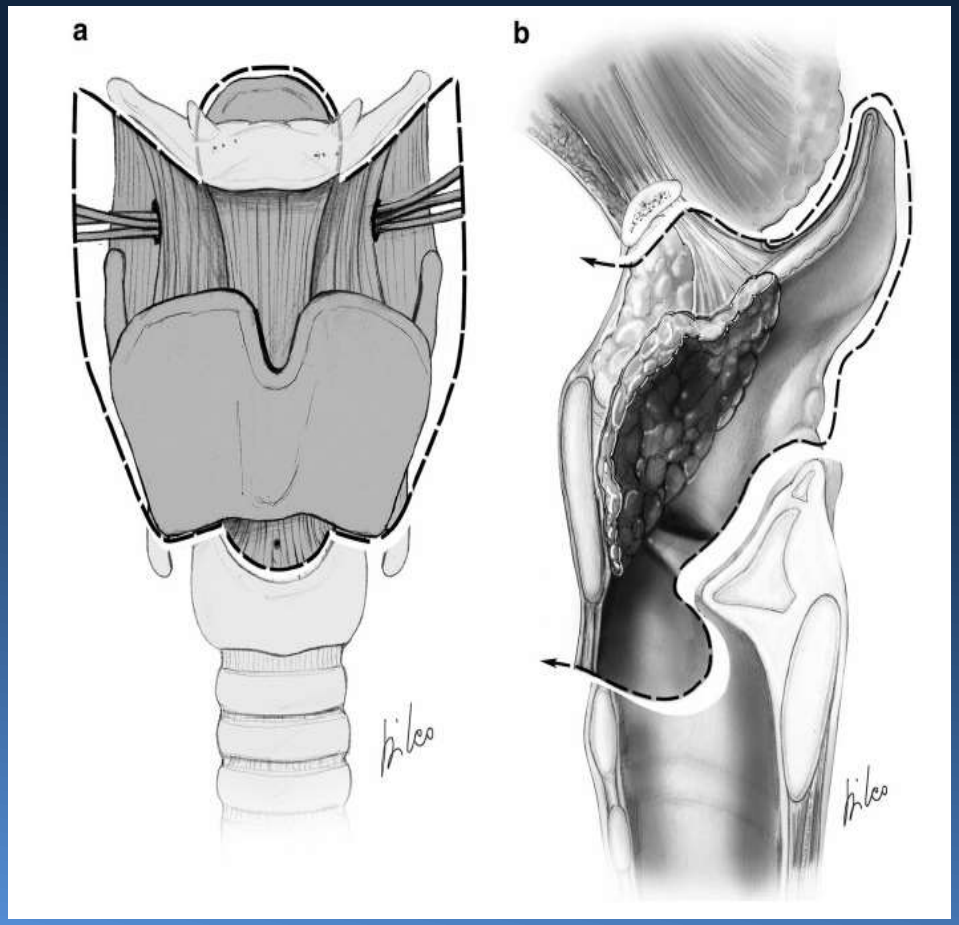
- Chronic Aspiration in 1.5-20% of patients
  - (Prades 2005)
- Permanent Trach for edema or stenosis 15%
  - (Sevilla 2008)

Type II Supracricoid laryngectomy

Type IIA



Type IIB



From Succo

Supracricoid Partial Laryngectomy-History

- Foederl 1906-suggested approach of repair of anterior larynx by pulling down the epiglottis
- Alajmo(Italy) 1971-first described modern approach
- Piquet(France) 1974
- Laccourreye(France)-1986

Supracricoid Laryngectomy

Indications

- If Glottis and anterior commissure involved
- Invades ventricle
- Vocal cord mobility decreased
- Paraglottic invasion
- Must be able to preserve one arytenoid

Supracricoid Laryngect

Supracricoid Laryngectomy

Indications

- ✓ T1-T2 supraglottic extending to the ventricle, false cord, glottis or anterior commissure
- ✓ T3 Transglottic tumors
- ✓ T3 supraglottis with cord fixation
- ✓ Invasion of the thyroid cartilage
- ✓ Selected anterior commissure tumors

Contraindications

- ✓ Fixation of both arytenoids
- ✓ Subglottic extension >5mm
- ✓ T4a with prelaryngeal infiltration

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Supracricoid Laryngectomy with CHEP

- What are the oncologic results?
  - Problems with data
    - Selected patients
    - Small number of institutions

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Review

Systematic review on T3 laryngeal squamous cell carcinoma; still far from a consensus on the optimal organ preserving treatment

M. Riga [a,*], L. Chelis [b], V. Danielides [a], T. Vogiatzaki [c], T.-L. Pantazis [d], D. Pantazis [d]

[a] *University Otorhinolaryngology Department, Democritus University of Thrace, University Hospital of Evros, Alexandroupolis, Greece*

[b] *Department of Clinical Oncology, University Hospital of Evros, Alexandroupolis, Greece*

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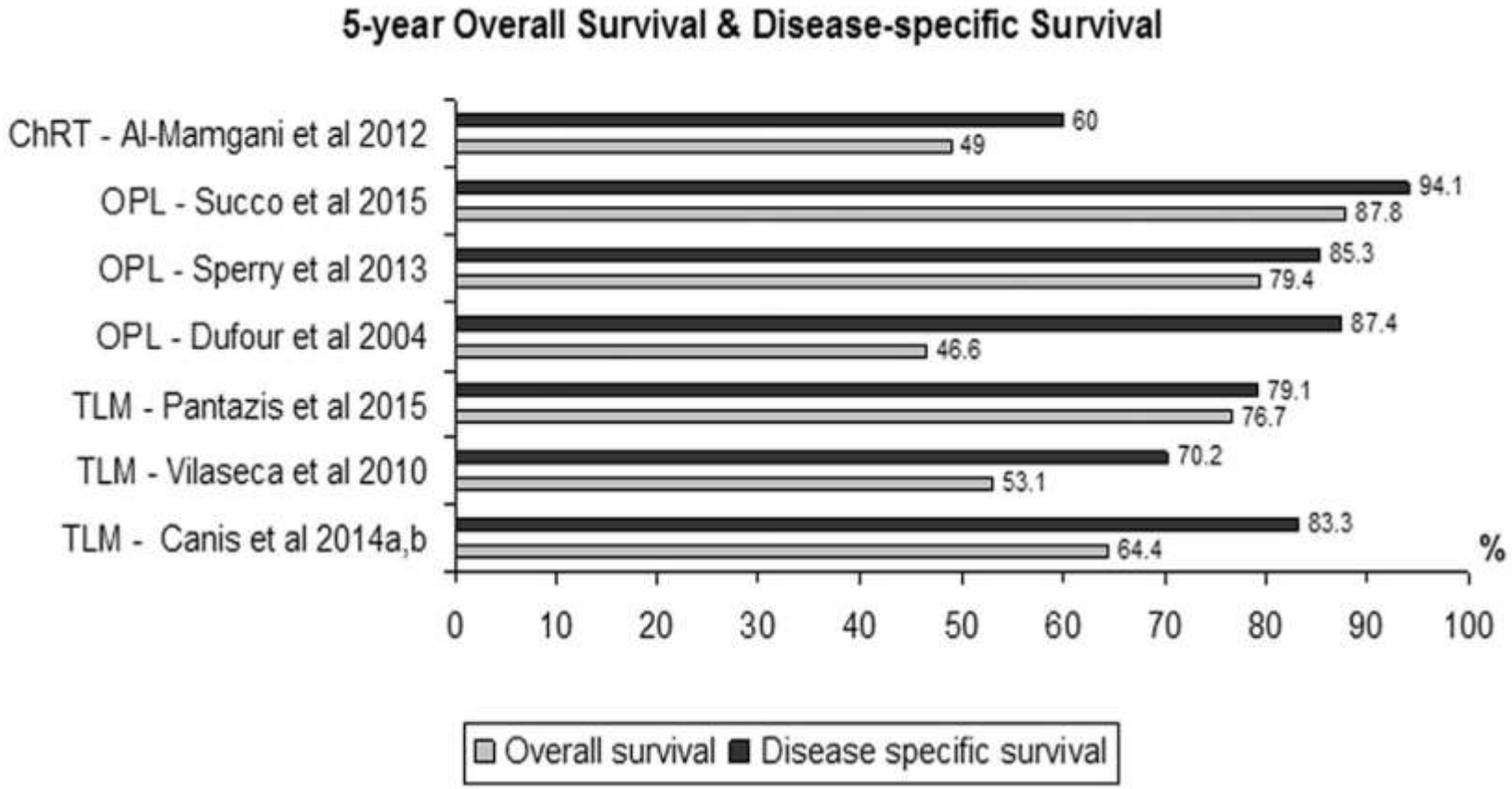
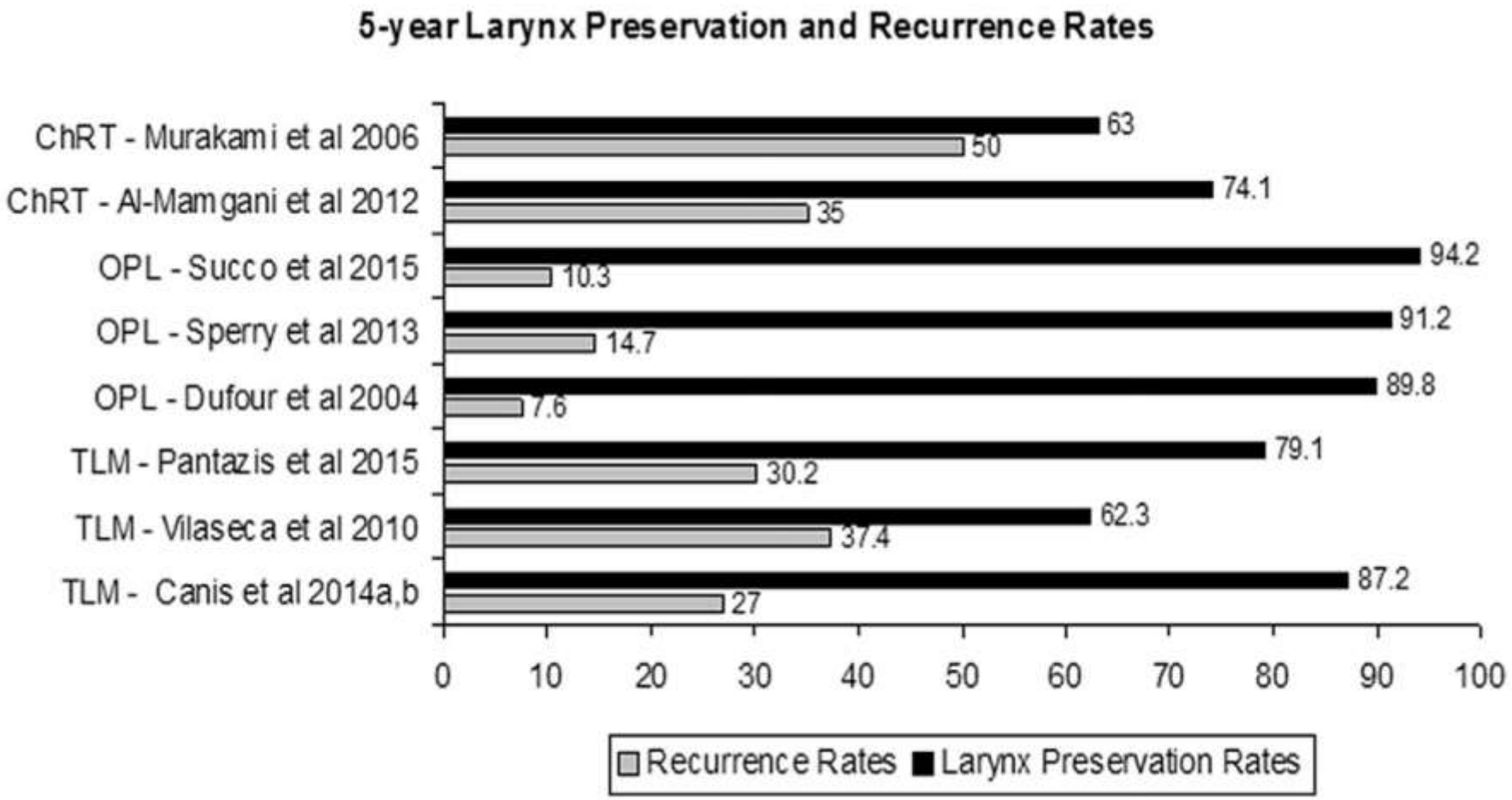
[d] *Otorhinolaryngology Department, Thriasion General Hospital of Athens, Greece*

Accepted 26 May 2016

T3 Laryngeal Cancer-Riga et al

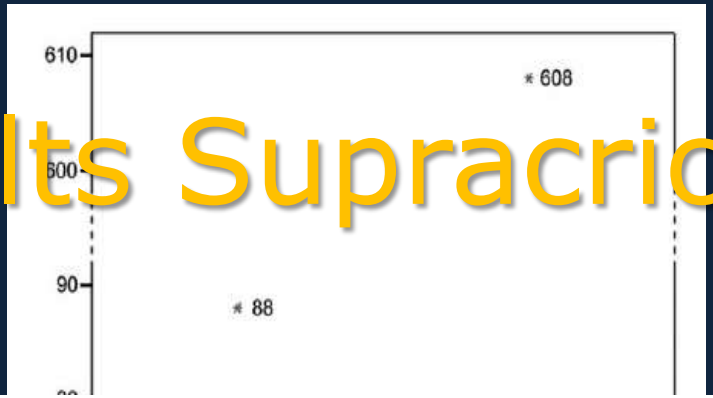


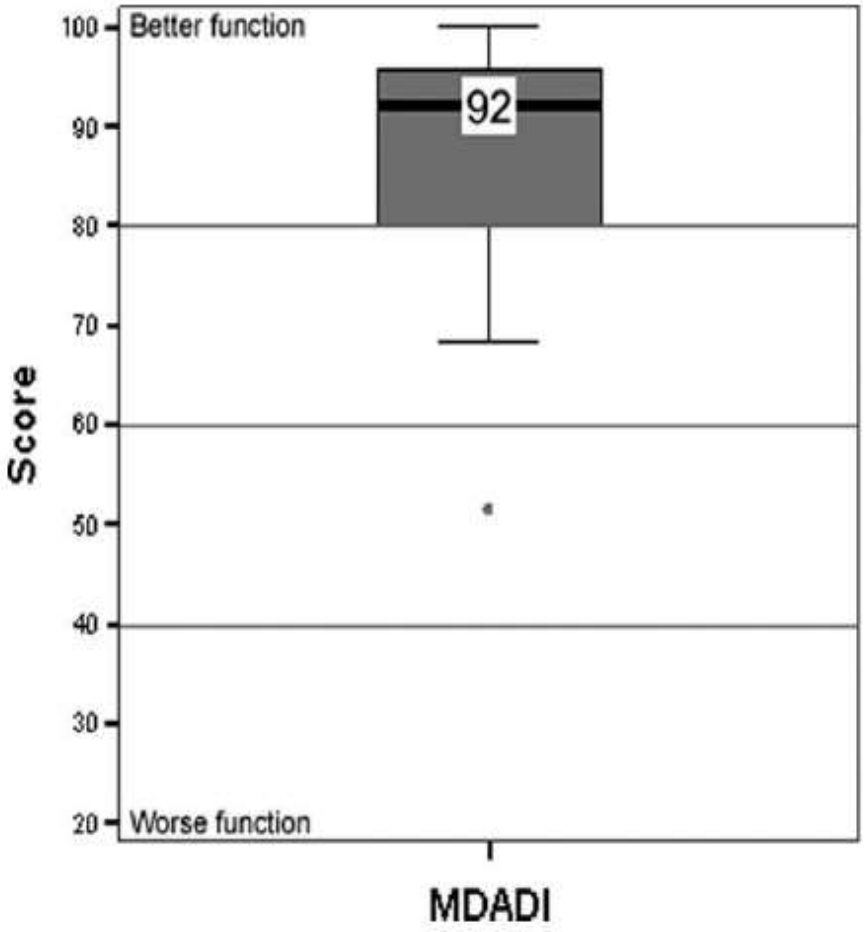
T3 Laryngeal Cancer-Riga et al

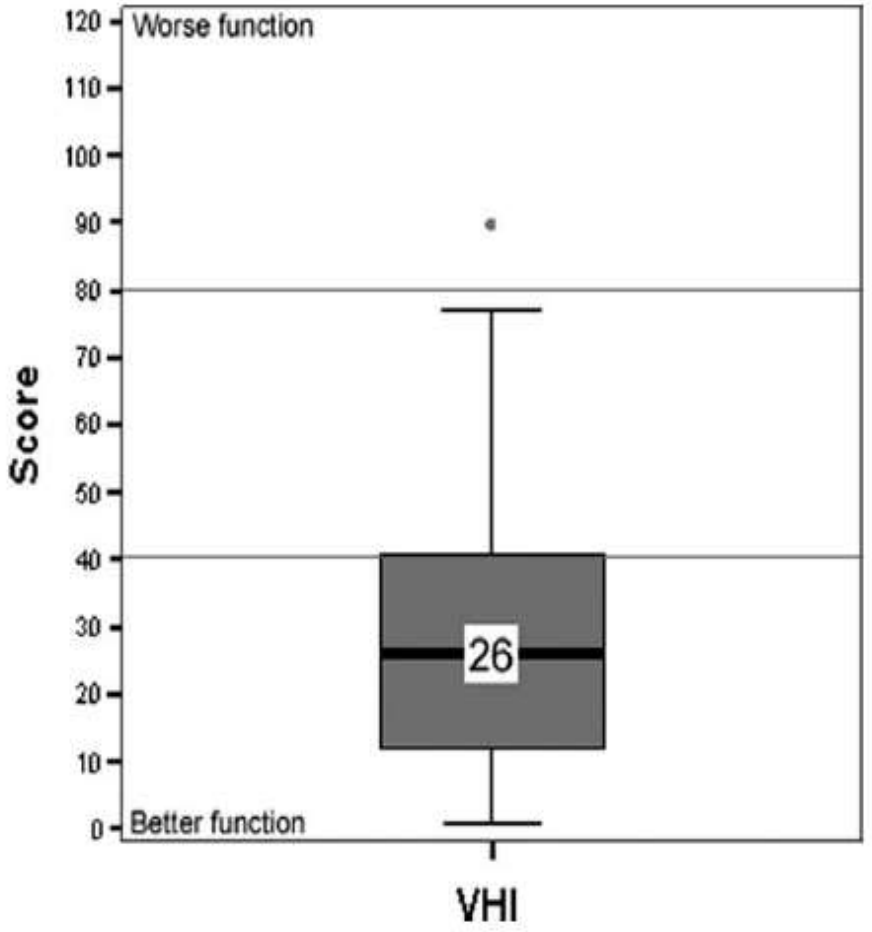


Functional Results Supracricoid

- From Gavilan 2012
- Selected patients







Type III-Supratracheal Laryngectomy

Oncologic outcomes of supratracheal laryngectomy: Critical analysis

Giuseppe Rizzotto, MD,[1] Erika Crosetti, MD,[2*] Marco Lucioni, MD,[1] Andy Bertolin, MD,[1] Valentina Monticone, MD,[3] Andrea Elio Sprio, PhD,[4] Giovanni Nicolao Berta, PhD,[4] Giovanni Succo, MD[3,5]

[1]Otorhinolaryngology Department, Vittorio Veneto Hospital, Vittorio Veneto, Treviso, Italy, [2]Otorhinolaryngology Department, Martini Hospital, Turin, Italy, [3]Otorhinolaryngology Department, San Luigi Gonzaga Hospital, Turin, Italy, [4]Department of Clinical and Biological Sciences, University of Turin, Turin, Italy, [5]Department of Oncology, University of Turin, Turin, Italy.

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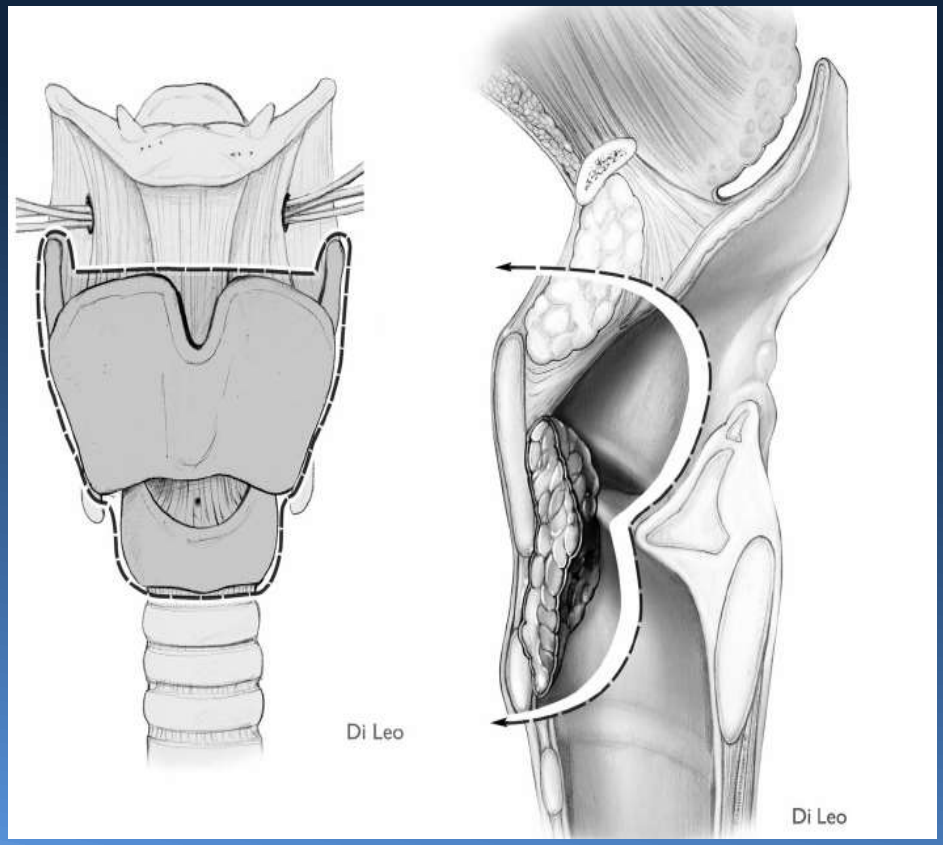
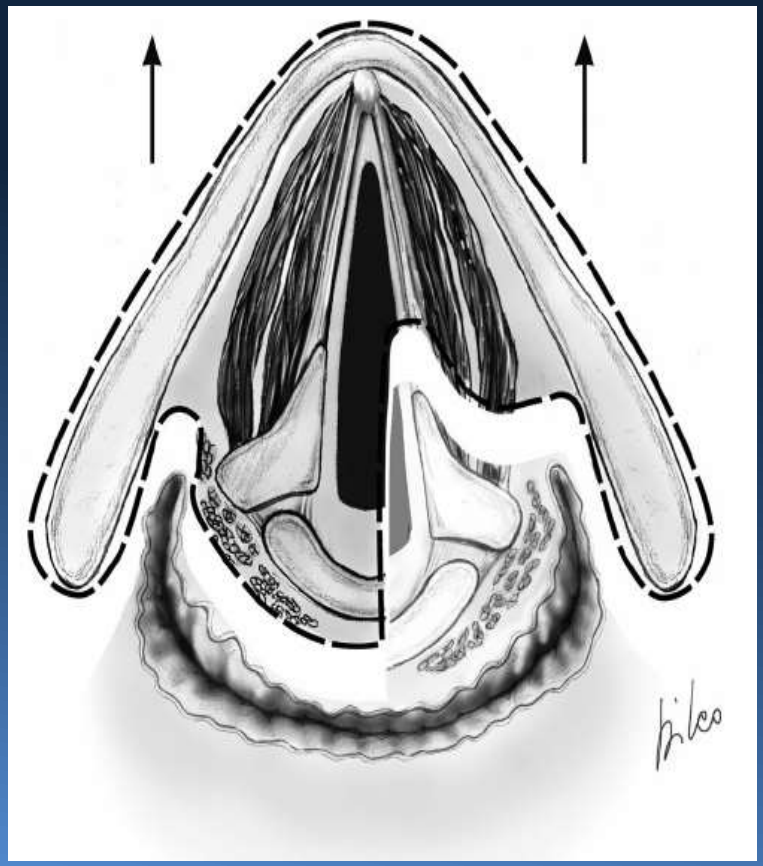
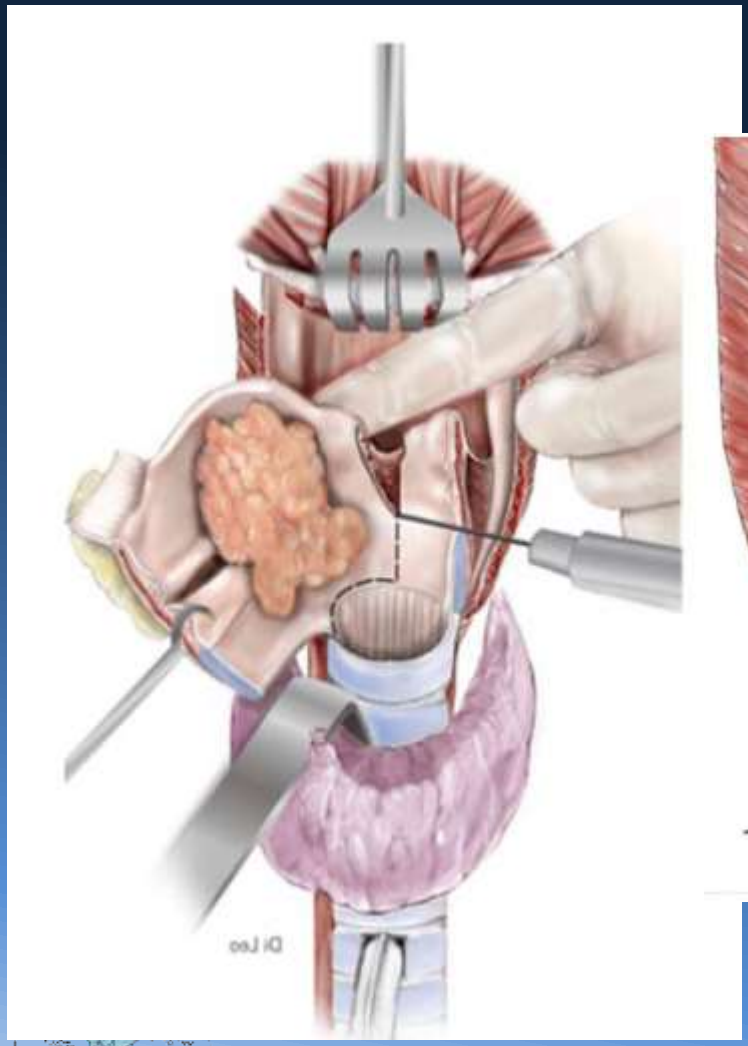
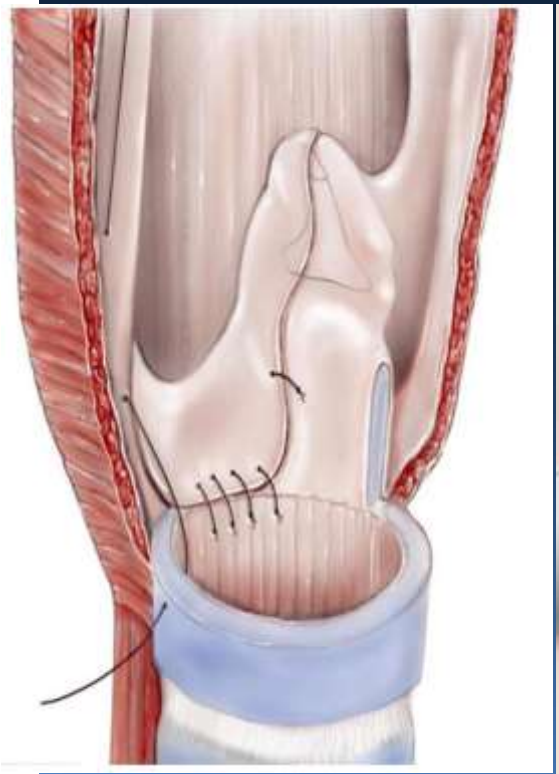
Type III-Supratracheal Laryngectomy

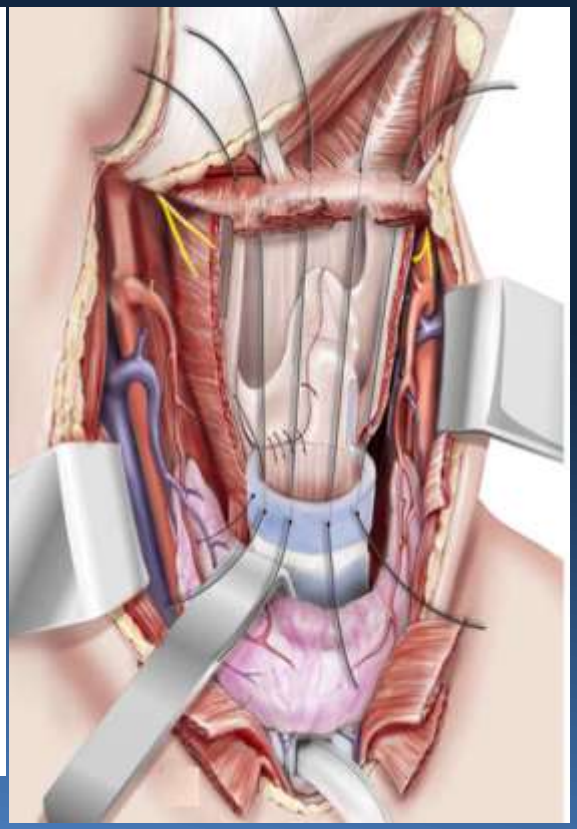




Type III Supratracheal from Succo







Supratracheal Laryngectomy

Indications

- ✓ Lateral/Anterior transglottic with fixation of one VF, normal mobility on contralateral
- ✓ Subglottic extension to upper border of cricoid
- ✓ Cricoid cartilage erosion

Contraindications

- ✓ T4a with prelaryngeal involvement
- ✓ Fixation of both arytenoids
- ✓ Tracheal involvement

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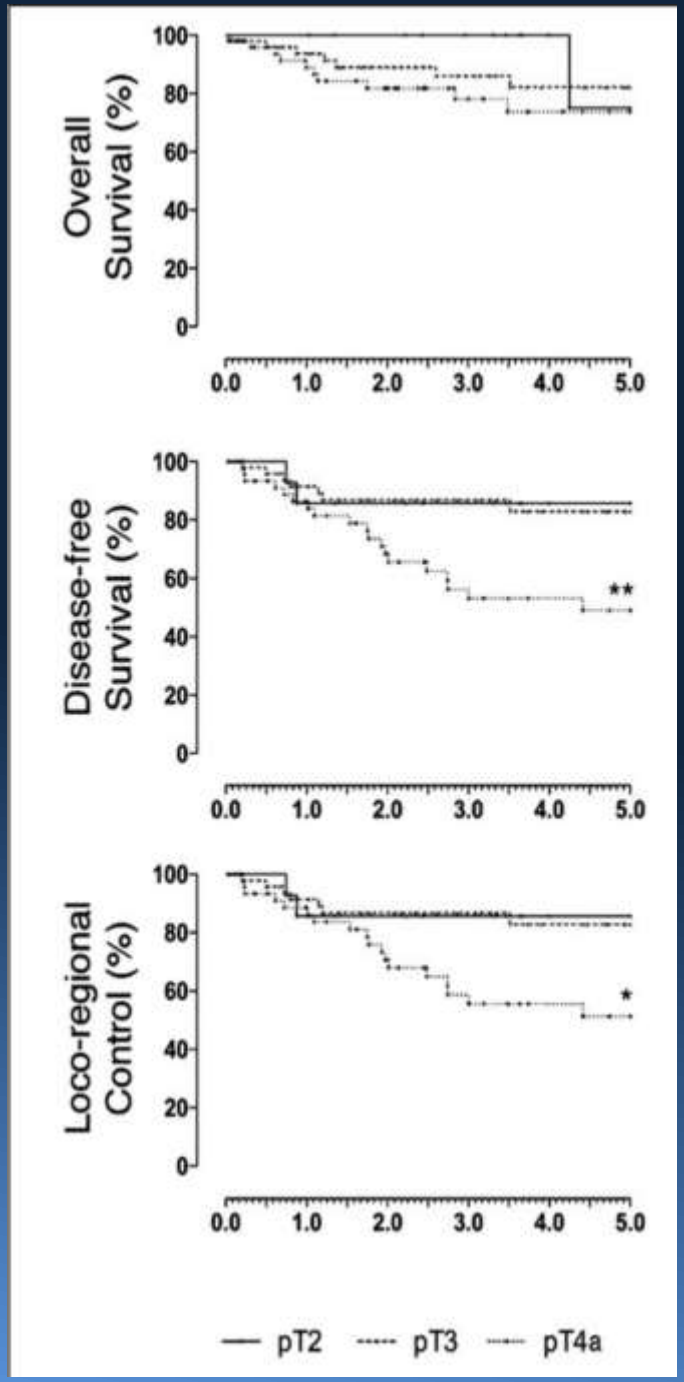
Type III supratracheal from Rizzotto

	No. of patients (%)	
Age, y		
Mean	58.3 ± 10.8	
Range	16–78	
Sex		
Male	93/115 (80.9)	
Female	22/115 (19.1)	
Karnofsky Performance Status		
100	70/115 (60.9)	
90	30/115 (26.1)	
80	15/115 (13.0)	
Pathological grade	Supraglottic	Glottic
pT2	0/115 (0.0)	14/115 (12.2)
pT3	1/115 (0.9)	49/115 (42.6)
pT4a	11/115 (9.6)	40/115 (34.8)
pN0	3/75 (4.0)	65/75 (86.7)
pN1		4/75 (5.3)
pN2		3/75 (4.0)
Level VI pN+		5/7 (71.4)



What about the patient who develops a recurrence following primary radiotherapy?

What about the patient with a T1 or T2 Glottic who fails radiotherapy?

- Total Laryngectomy
  - Often used because of the belief that partial surgery not possible post radiation
- Partial Laryngectomy
  - Often not considered because of the lack of local tissue available for reconstruction and the belief that disease related outcomes inferior
- Endoscopic Laser excision
  - Increasing interest based on the primary Tx experience

What about salvage with Transoral laser?

Evidence: Literature Review

- Computerized Medline search
- From 1990 to current
- Laryngeal neoplasm/AND salvage therapy
- Recurrent SCC after primary radiotherapy for
- Tis, T1, T2
- Include n ≥ 20, follow-up ≥ 2 years

2017

Surgical Salvage TOL

	n T1/2	AC+	F/U	LC	Total laryngectomy
Ansarin Arch '07	37 19/18	78%	18-88 (44)	68%	30%
Steiner HN '04	21 11/10	62%	3-132 (38)	71%	19%
Quer '00	21	10%	30-126	76%	25%

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Issues with TOL for salvage

- Literature limited
- Extended margins with high rates of +ve margins
- Many patients require multiple procedures
- Is the ultimate laryngectomy rate higher than patients undergoing segmental procedures?

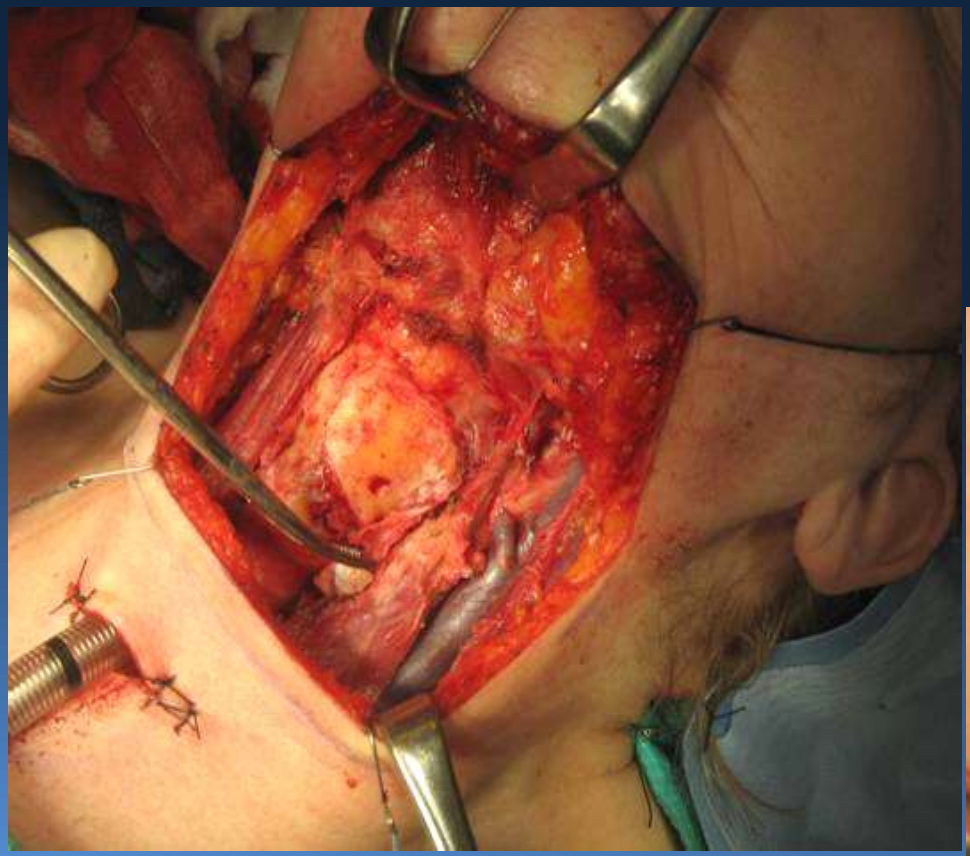
Salvage Vertical Partial Laryngectomy : outcomes

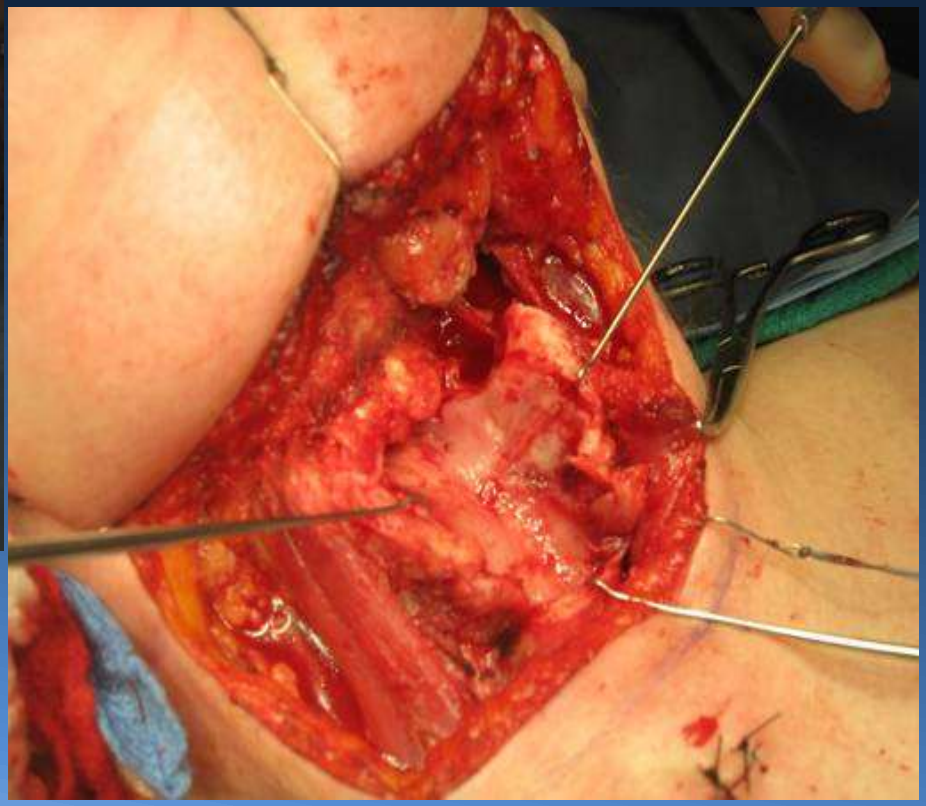
	N (T1/2)	LC (ultimate LC)	Total laryngectomy	DSS
Sewnaik HN '05	21 (14/7)	76% (100%)	19%	100%
Nibu HN '97	21 (17/4)	86% (100%)	14%	100%
Lavey AJS '91	25 (17/8)	96% (96%)	4%	92%

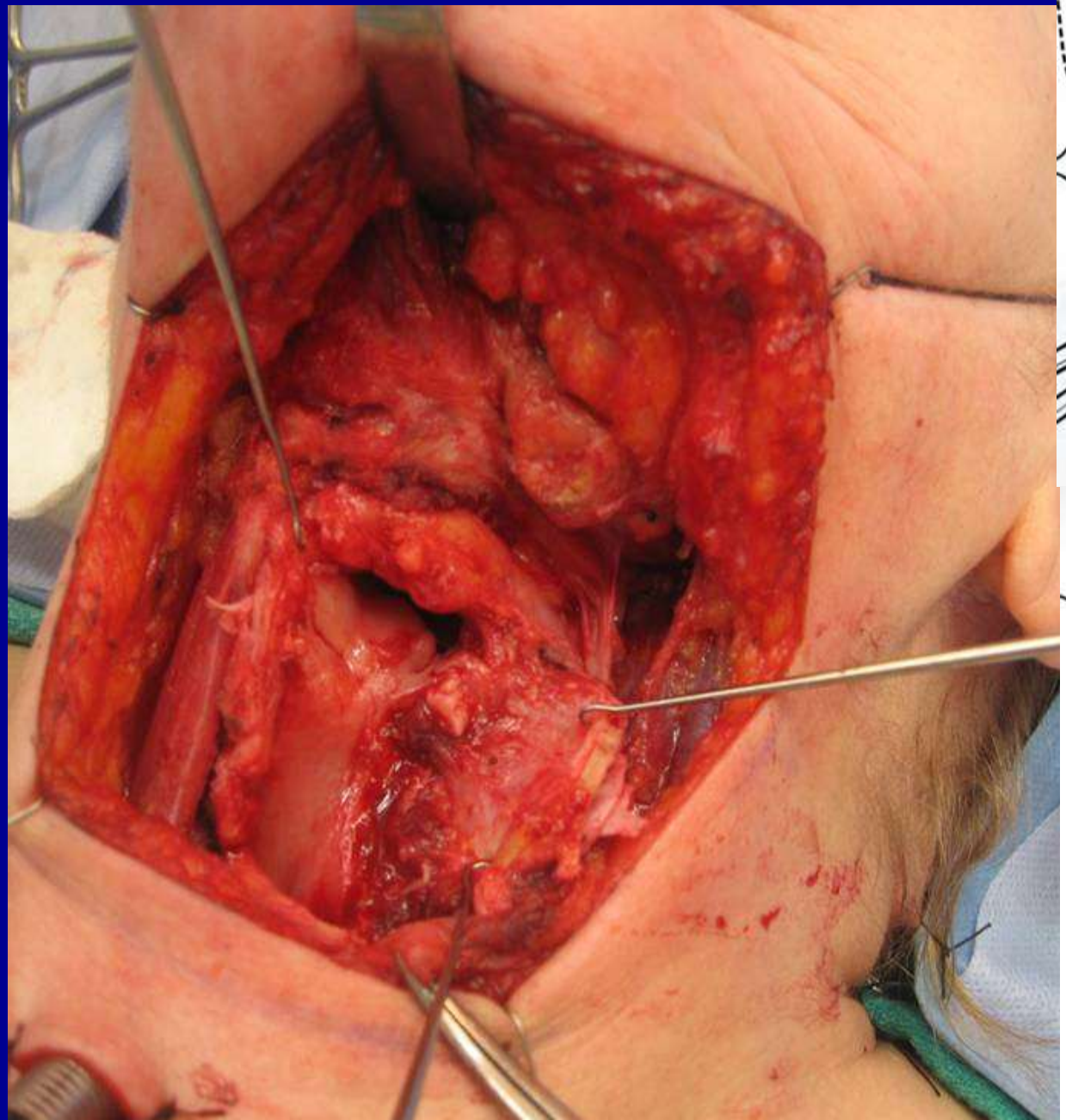
Salvage Vertical Partial Laryngectomy : outcomes

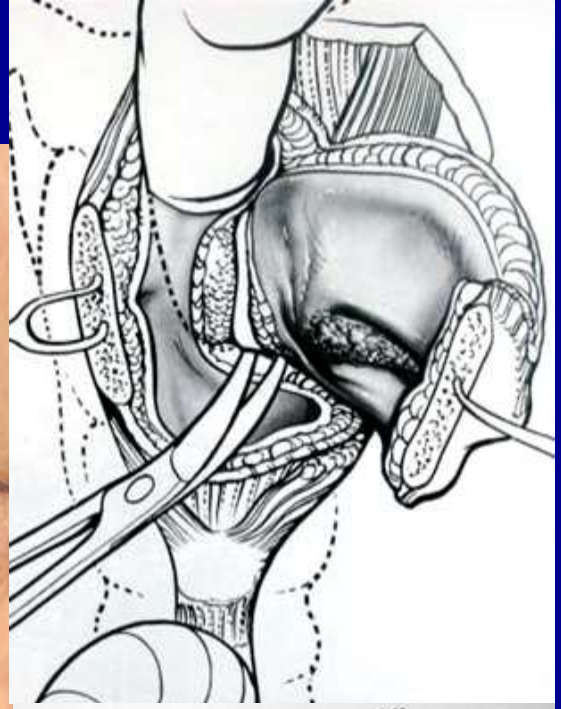
	n T1/2	LOS M (range)	Complications	G-tube Swal days
Sewnaik HN ’05	21 (14/7)	12 (7-28)	10% Fistula 15% Chondritis	0% 12 (1-34)
[redacted]				
Nibu HN ’97	21 (17/4)	?	10% Fistula	0% 10 (4-19)
[redacted]				
Lavey AJS ’91	25 (17/8)	11	4% Fistula 4% Chondritis	0% 7

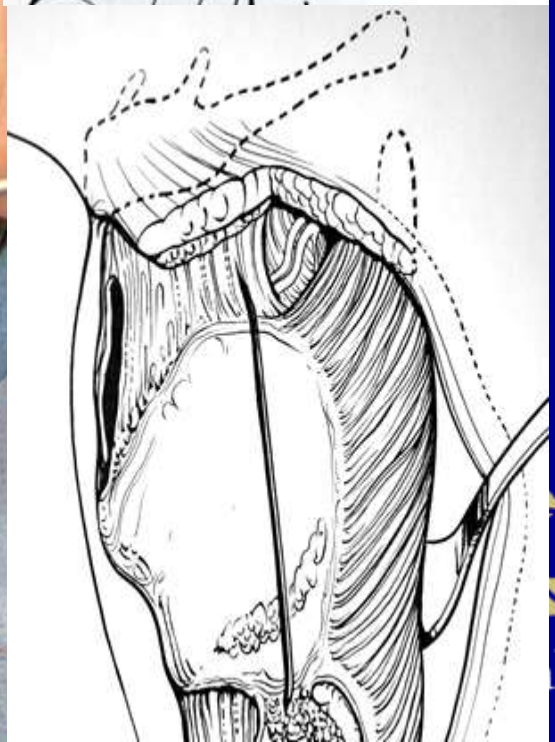
Salvage Vertical Laryngectomy







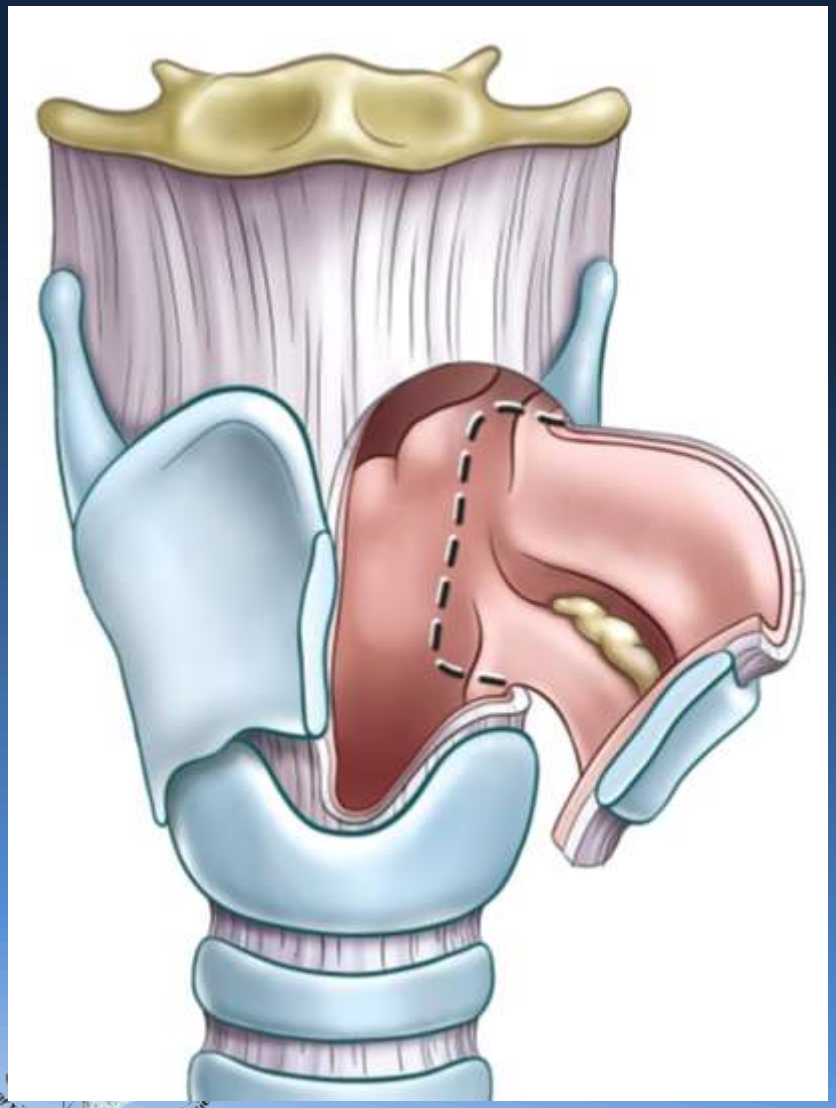


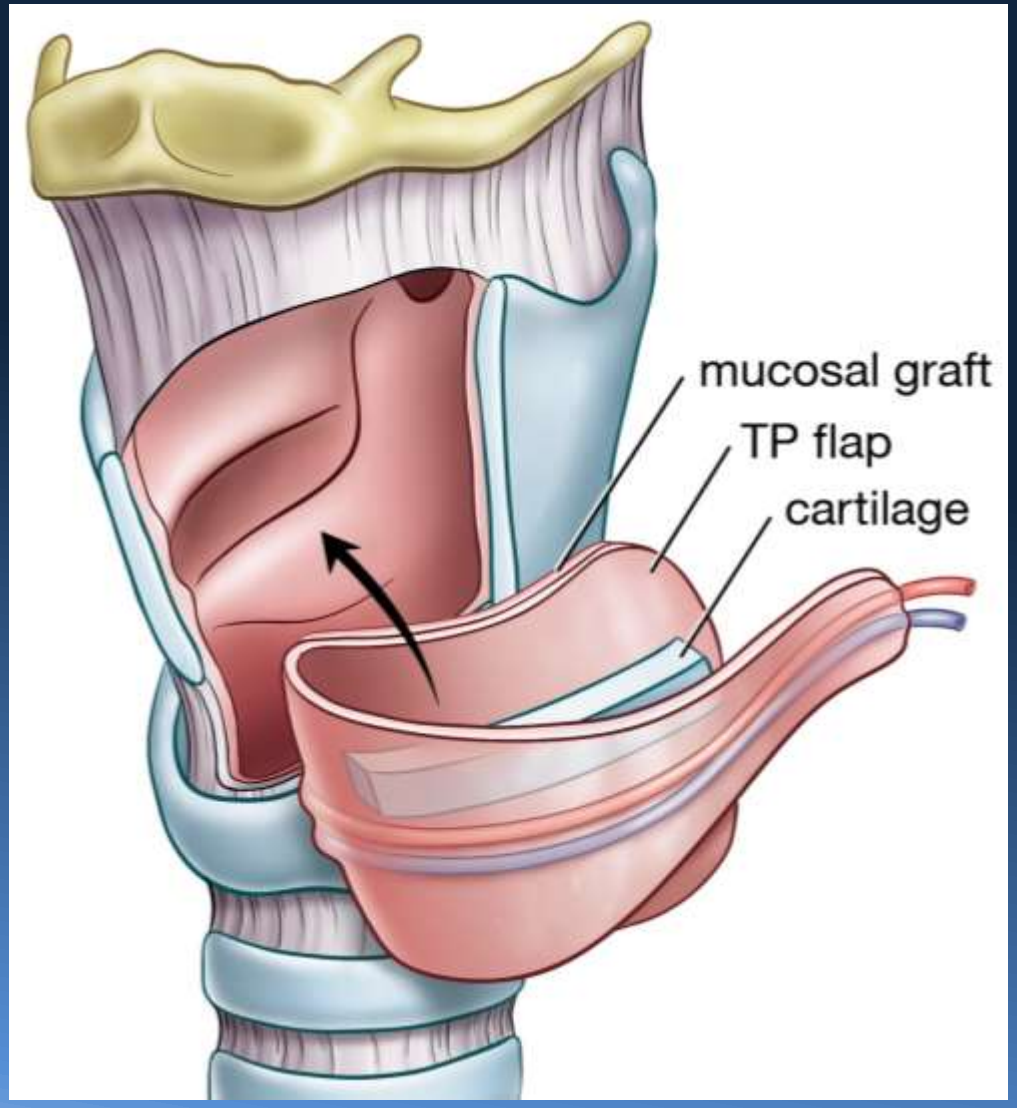


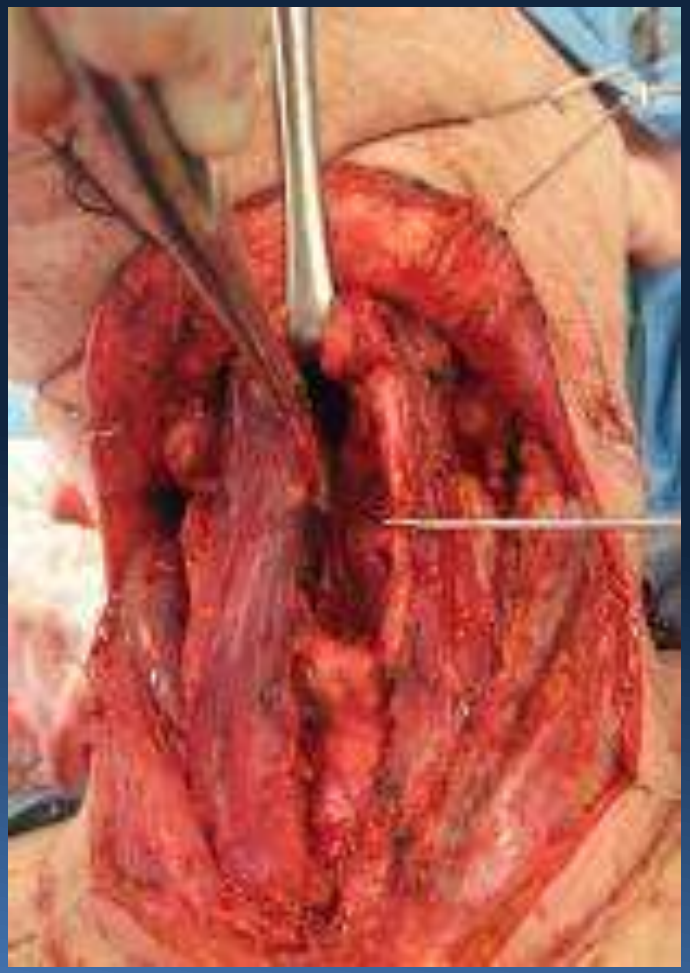
Vocal Cord Reconstruction

- Direct Closure
- Epiglottopexy
- Cartilage Muscle Flap

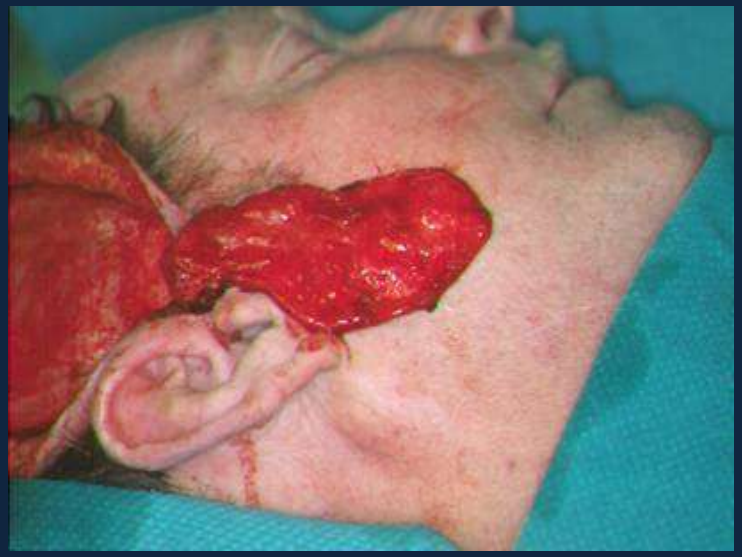
VPL & TPFF Reconstruction







Strap muscle flap historical and present



Free Tissue Transfer – TP Flap
(Ralph Gilbert)

Nuance

Stent?

2017

What about supracricoid laryngectomy in the failure setting?

SUPRACRICOID PARTIAL LARYNGECTOMIES AFTER RADIATION FAILURE: A MULTI-INSTITUTIONAL SERIES

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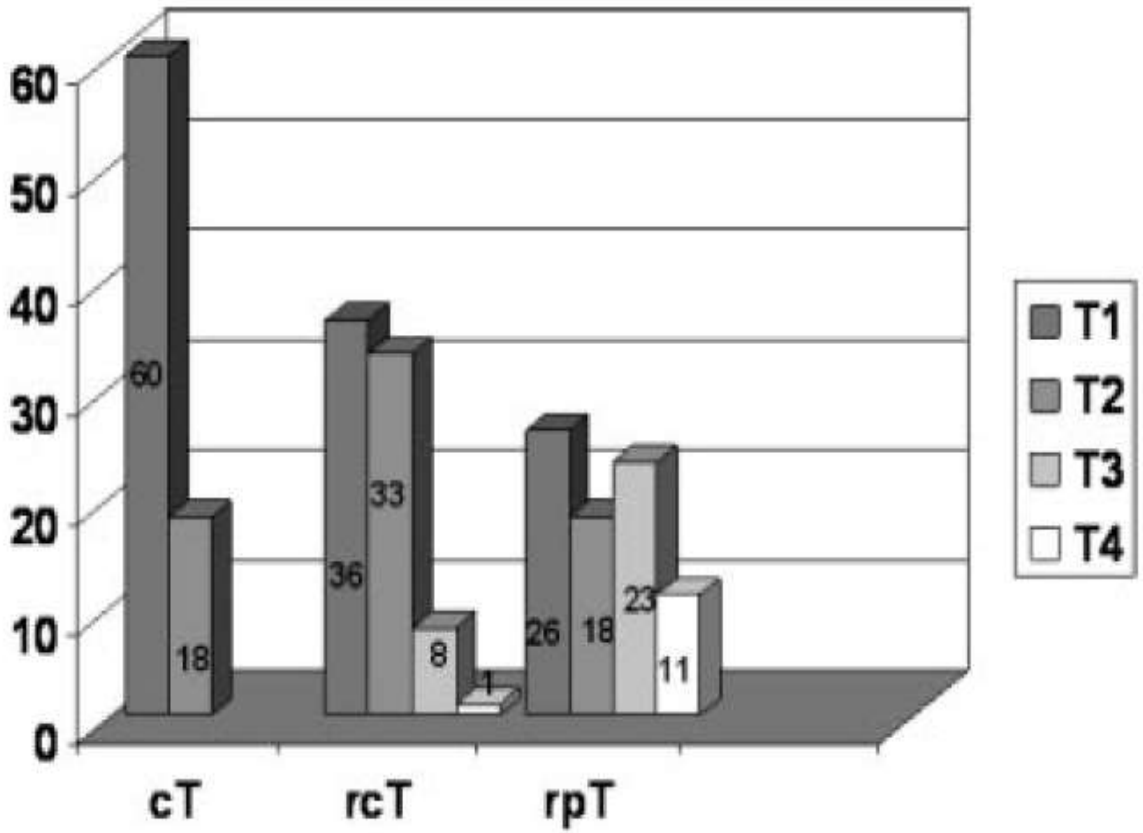

FIGURE 1. T classification at the first diagnosis (cT), at the time of the recurrence (rcT) and after salvage surgery (rpT) in this study's patient population ($N = 78$).

Supracricoid for Radiation Failure

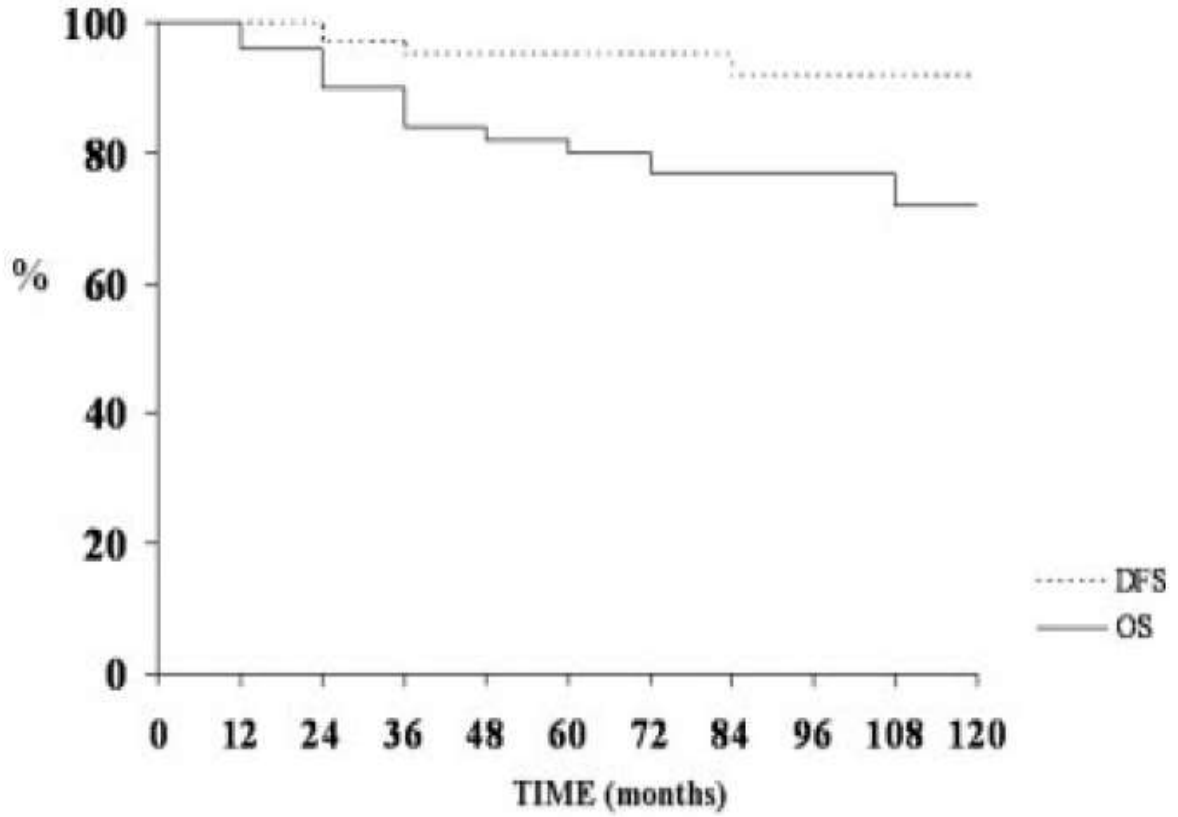

FIGURE 2. Overall and disease-free survival of patients treated by SCPLs after radiotherapy failure.

Salvage Organ Preserving Surgery vs Total Laryngectomy

	RT + OPS+/- TL	RT + TL*
local control rate :	76% - 96%	70% - 94%
ultimate control rate :	88% - 100%	91% - 95%
disease-spec survival :	86% - 100%	86% - 98%

Laryngeal preservation in 70-80%

*Frata 2005; Garden, 2003; Mendenhall, 2001; Warde, 1998; Le, 1997 : N>3000

Summary RT failure early glottic

TOL appropriate for small volume recurrence-high risk of local failure

Open partial procedures have higher rates of loco-regional control with options vertical partial or supracricoid

Laryngeal and functional preservation possible in a high percentage of patients with disease amenable to partial surgery

Summary

Surgery has an important role in the management of early and advanced stage laryngeal cancer

New techniques in Reconstructive and Minimally Invasive Surgery have the potential to improve outcomes

There is no " Treatment of Choice" but rather "Choices in Treatment"

2017

Summary

1. Focus of the management of patients with laryngeal carcinoma should be the preservation of functional speech and swallowing.
2. A variety of surgical and non-surgical techniques appear to have application in meeting this goal.
3. The surgical community has the responsibility to subject new surgical approaches to clinical trials before the wide acceptance and application of these techniques.

Goals:

Achieve Cure

Laryngeal Preservation

Improved Quality of Life

University Health Network




UHN
Toronto General
Toronto Western
Princess Margaret
Toronto Rehab
COURAGE LIVES HERE

International Federation of Head and Neck Oncologic Societies
Founded 1987