

Faculty Disclosure

I advise that the following presentation will NOT include discussion on any commercial products or service and that there are NO financial interests or relationships with any of the Commercial Supporters of The Asia-Oceania Otolaryngology Congress.

12th Asia-Oceania Otolaryngology Congress

Vertical Partial Laryngectomy Oncological and Functional Results

Prof. KEN-ICHI NIBU, MD, PhD
Dept. of Otolaryngology-Head & Neck Surgery
Kobe University, Graduate School of Medicine
Kobe, Japan

Clinical Outcome of Laryngeal Cancers

Glottic Cancer

	%	Disease specific 5 year survival rate	Laryngeal preservation
T1	47%	97%	95%
T2	15%	96%	68%
T3	2.5%	75%	20%
T4	2.5%	81%	

Supraglottic Cancer

	%	Disease specific 5 year survival rate	Laryngeal preservation
T1	2%	100%	85%
T2	8%	85%	54%
T3	12%	75%	14%
T4	5%	65%	

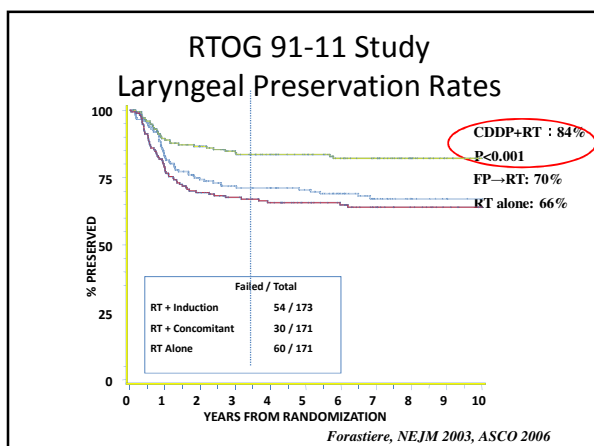
Osaka Medical Center for Cancer and Cardiovascular Diseases 1990-1999

Chemotherapy for head & Neck Cancers Meta-Analysis

- No significant benefit associated with adjuvant or neoadjuvant chemotherapy
- Non-significant negative effect of chemotherapy in organ preservation strategy
- Concomitant chemoradiotherapy
> Neoadjuvant Chemotherapy + RT

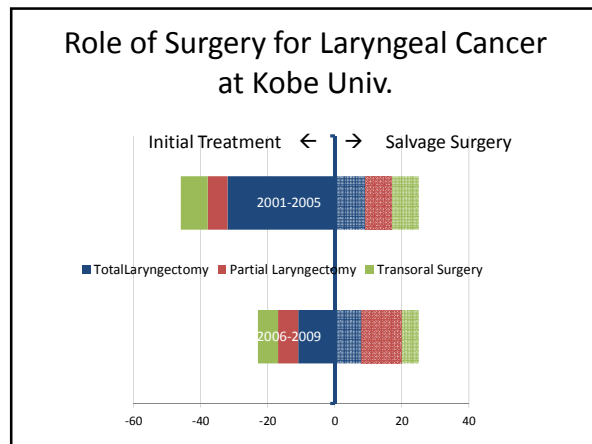
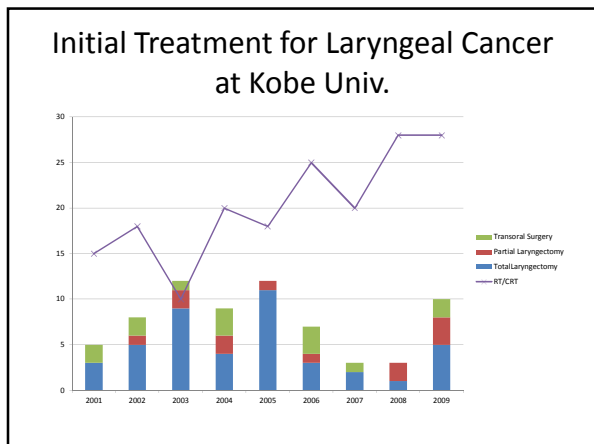
Pignon JP. Lancet 2000
Pignon JP. Radiotherapy and Oncology 2009

Timing of CTX	Risk reduction	P-value	Absolute Benefit (5 y)
Adjuvant CTX	-6%	N.S.	1%
Induction CTX	4%	N.S.	2.4%
Concomitant CTX	19%	<0.0001	6.5%



Roles of Conservative Surgery for Laryngeal Cancer

1. As initial treatment for untreated limited cancers
2. As salvage surgery for radiation-failure
3. As initial treatment for previously irradiated larynx
4. As initial treatment for young patients
5. As initial treatment for patients with poor conditions
6. As initial treatment for unfavorable advanced cancers



Treatment Policy for Laryngeal Cancers Kobe University Hospital 2010

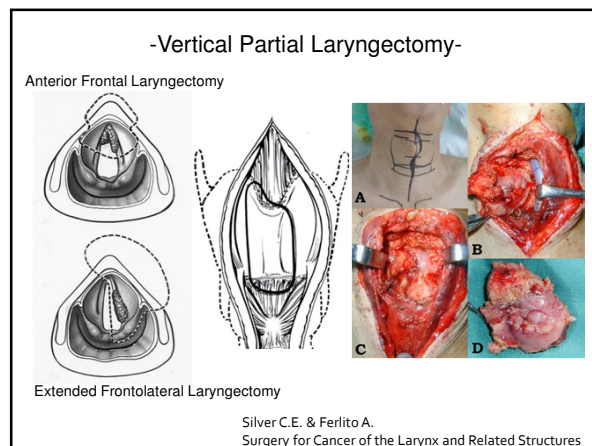
- T1: 2 Gy x 33
- T2: 1.2 Gy x 2/day x 30
- T3 / unfavourable T2:
 - Partial Laryngectomy (if possible)
 - Total Laryngectomy
 - CCRT (2 Gy/day x 35 + CDDP80mg/m²/every 3weeks)
- T4 : Total Laryngectomy
 - CDDP 60mg/m²+TXT50mg/m²+5FU600mg/m² x5
 - 2Gy/day x 35 +CDDP80mg/m²

Roles of Conservative Surgery for Laryngeal Cancer in 2009

1. As initial treatment for untreated early cancers
2. As salvage surgery for radiation-failure
3. As initial treatment for previously irradiated larynx for other disease
4. As initial treatment for younger patients
5. As initial treatment for advanced cancers
6. As initial treatment for radioresistant cancers

Transcervical Conservative Laryngeal Surgery for Laryngeal Cancers

- Vertical Partial Laryngectomy**
 - Corpectomy via Thyrotomy
 - Frontolateral Laryngectomy
 - Anterior Frontal Laryngectomy
 - Extended Frontolateral Laryngectomy
 - Hemilaryngectomy
- Horizontal Partial Laryngectomy**
 - Epiglottectomy
 - Supraglottic Laryngectomy
 - Extended Supraglottic Laryngectomy
- Subtotal Laryngectomy**
 - Supracricoid Laryngectomy



-Vertical Partial Laryngectomy-

Indication: Glottic Cancer r T1a, rT1b, T2 rT2, T3

Contra-Indications:

- Apparent invasion to paraglottic space
- Apparent posterior extension beyond vocal process
- Apparent subglottic extension to cricoid cartilage
- Fixation of vocal cord

at first visit Recurrence Postoperation

-Vertical Partial Laryngectomy-

Anterolateral Laryngectomy

Reconstructed Larynx is secondarily closed in irradiated cases

Closure of Laryngocutaneous Fistula

Silver C.E. & Ferlito A. Surgery for Cancer of the Larynx and Related Structures

-Horizontal Partial Laryngectomy-

Indication : Supraglottic Cancer T1 T2 r T1 r T2

Contra-Indication

- Apparent Invasion to paraglottic/preepiglottic spaces
- Apparent Invasion to vallecula/base of tongue
- Invasion to cricoarytenoid joint
- Invasion to laryngeal ventricle/petiole
- Poor Pulmonary Function

-Horizontal Partial Laryngectomy-

-Supracricoid Laryngectomy-

Supraglottic Cancer (with CHP)


Glottic Cancer (with CHEP)

Silver C.E. & Ferlito A. Surgery for Cancer of the Larynx and Related Structures

—Supracricoid Laryngectomy—
 Indication: Supraglottic/Glottic Cancer r T2, r T3
 · Apparent invasion to pre/paraglottic spaces
 · Limited invasion to vallecula/base of tongue

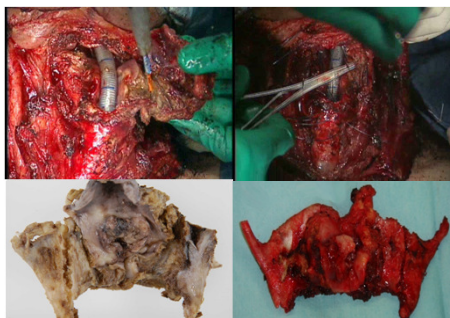
Contra-Indication

- Poor Pulmonary Function
- Subglottic extension to cricoid cartilage
- Invasion to cricoarytenoid joint
- Apparent invasion to vallecula/base of tongue




Glottic Cancer with impaired mobility of vocal cord:
 SCL with cricohyoidoepiglottopexy
 Supraglottic Cancer with inferior extension:
 SCL with cricohyoidopexy

Supracricoid Laryngectomy (CHEP· CHP)

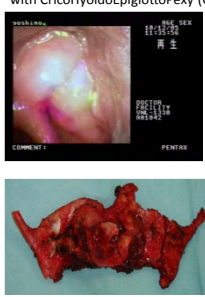
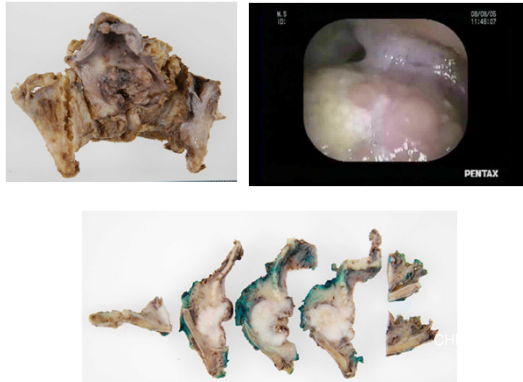


Supracricoid Laryngectomy (CHEP· CHP)


Supracricoid Laryngectomy with CricoHyoidoPexy (CHP)




Supracricoid Laryngectomy with CricoHyoidoEpiglottopexy (CHEP)

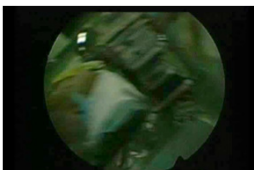
Transoral Partial Laryngectomy



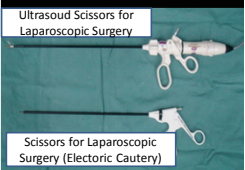
Endoscopy for sinus surgery



Laparoscope



Ultrasound Scissors for Laparoscopic Surgery



Scissors for Laparoscopic Surgery (Electric Cautery)

Outcomes of Salvage Surgery for Laryngeal Cancer 2001-2009

		TOS	V/H PL	CHEP/CHP	TL
Glottic Ca.	T1	9	8		4
	T2	3	4	1	9
	T3		2		1
	T4				10
Supraglottic Ca.	T1	1	2		
	T2		1	1	5
	T3				1
	T4				
Local Failure		1*/13	2*/17	0/2	0/30
Death		0/13	2*/17	0/2	3*/30

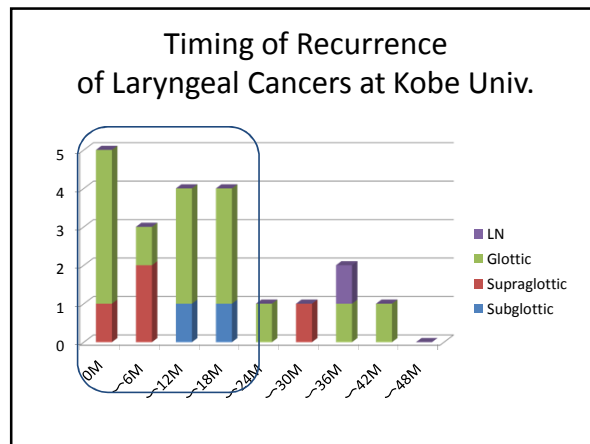
(): No. of Salvage Surgery
 * successfully salvaged by PL
 **due to distant metastases

Outcomes of RT/ CRT for Laryngeal Cancer 2001-2009

	No. of Pts	Local Ctrl RT / CRT	Preserved Larynx	Surgical Procedures	Survival
Glottic Cancer	T1a	56 (95%)	56 (100%)	PL 2, TO 1	56 (100%)
	T1b	32 (81%)	30 (94 %)	TL 2, PL 2, TO 2	32 (100%)
	T2	57 (84%)	54 (95%)	TL 3, PL 3, TO 2	53 (93%)
	T3	9 (78%)	7 (78%)	TL 1, IO 1	8 (89%)
Supraglottic Cancer	T1	8 (100%)	8 (100%)	ND	56 (100%)
	T2	11 (91%)	10 (91 %)*	TL 1	10 (91%)

TOS: Transoral Surgery, V: Vertical, H: Horizontal
 PL: Partial Laryngectomy, TL: Total Laryngectomy
 IO: Inoperable

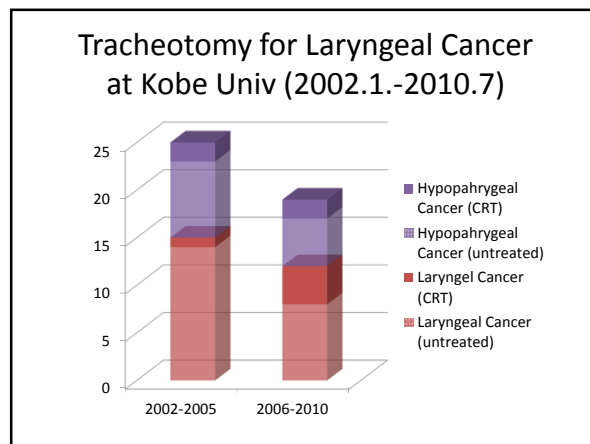
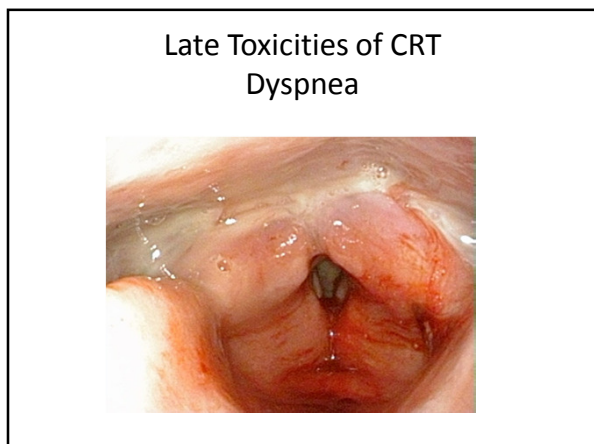
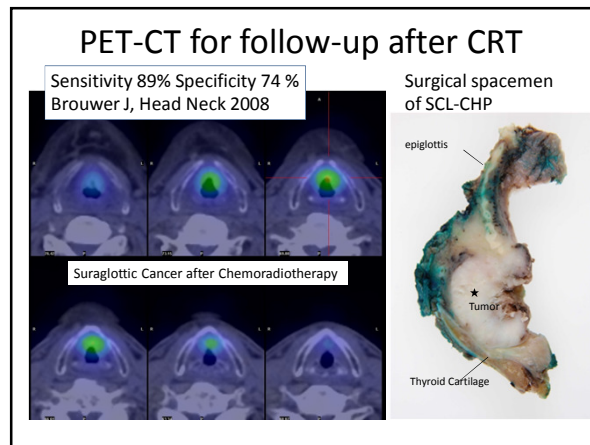
(): No. of Salvage Surgery Pts: Patients, Rec: Recurrence

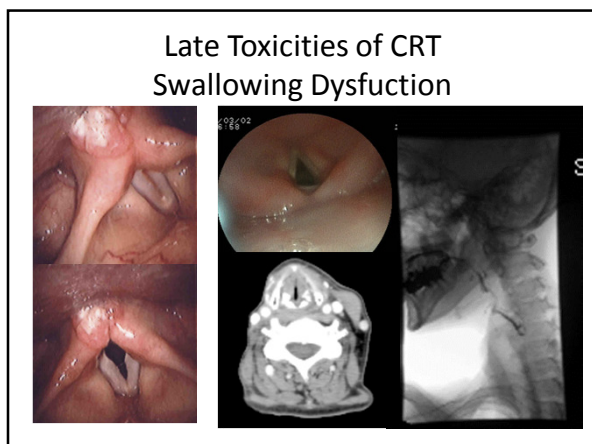


Detecting recurrent laryngeal carcinoma after (chemo)radiotherapy

- The recurrence rate of T2 to T4 laryngeal cancer after radiotherapy is between 25–50%.
- Early detection of recurrence is mandatory to perform partial laryngectomy in selected cases with limited recurrence.
- However, distinguishing between recurrent cancer and postradiotherapy changes, including fibrosis, edema and soft tissue and cartilage necrosis, is difficult.
- About 50% of patients with severe edema or necrosis following radiotherapy will have a recurrence.
- The trauma of multiple biopsies in heavily radiated tissue may initiate infection, chondritis and further edema.

Brouwer J. Eur Arch Otorhinolaryngol 2004





Severe Late Toxicity after Concurrent Chemoradiation for Locally Advanced Head and Neck Cancer : An RTOG Analysis

Variable	91-11	97-03	99-14	Total
Feeding tube dependence > 2 years post-radiation therapy	-	29*	-	29 (13%)
RTOG late toxicity criteria, grade 3+				
Pharyngeal dysfunction	16	28	19	63
Laryngeal dysfunction	22	6	0	28
Death	11	9	2	22
Other (eg, infection, fistula)	3	0	1	4
Any	38*	40*	21*	99*
No severe late toxicity event (controls)	50	62	19	13
Total No. of Patients for this Study	88	102	40	230

Machtay M et al. J Clin Oncol (2008)

Pharyngocutaneous Fistula after Laryngectomy following concurrent chemoradiotherapy

	Initial Treatment		
	RT	ICT → RT	CRT
VA LCG Sassler et al (1995)	-	-	50 %
RTOG 91-11 Weber RS et al. (2003)	-	15 (7) %	25(10) %
Ganly I et al.(2005)	12 %	16 %	-
Furuta Y et al.(2008)	9 (6) %	18(12) %	-

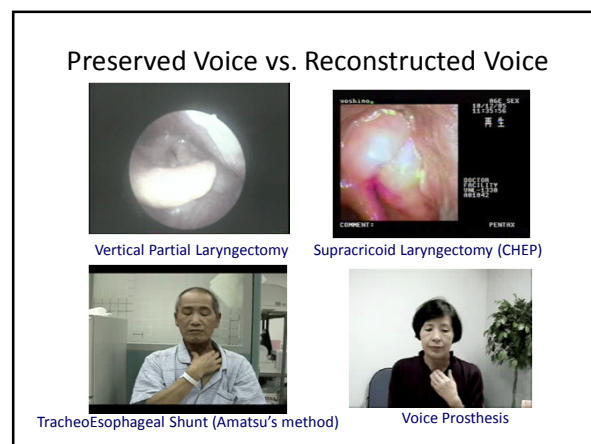
VA LCG: Veteran Affairs Laryngeal Cancer Group
() : Severe Cases

- ### Roles of Conservative Surgery for Laryngeal Cancer
1. As initial treatment for untreated limited cancers
 2. As salvage surgery for radiation-failure
 3. As initial treatment for previously irradiated larynx
 4. As initial treatment for young patients
 5. As initial treatment for patients with poor conditions
 6. As initial treatment for unfavorable advanced cancers

Outcomes of Surgery as Initial Treatment for Laryngeal Cancer 2001-2009

		TOS	V/H PL	CHEP/CHP	TL
Glottic	T1a	5			
	T1b	6			
	T2	4	2		3
	T3		1	1	16
	T4			1	9
Supraglottic	T1	2			
	T2	3	2		2
	T3		2	2	10
	T4				3
Total	18	9	4	43	
Tracheostomy	0	1*	0	-	
Laryngectomized	0	1**	1***	-	

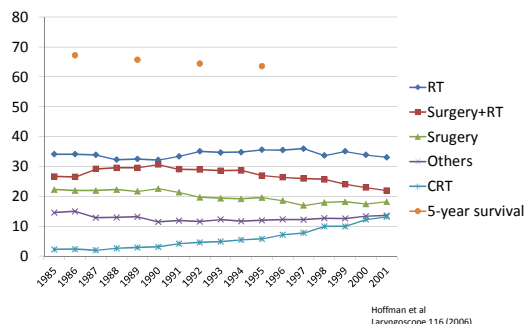
*airway obstruction, **local recurrence, ***cartilage necrosis



Preserved Voice vs. Reconstructed Voice

	Vertical Partial Laryngectomy	Tracheo-Esophageal Phonation (Voice Prosthesis /Amatsu's method)	Normal (Male)
Maximum Phonation Time	8 sec	12 sec	30 sec
Average Expiratory Flow Volume	300 ml/s	140 ml/s	100 ml/s
AC/DC ratio	40 %	40 %	<50%
Fundamental Frequency	220 Hz	100 Hz	120-150 Hz
Voice Intensity	75 dB	78 dB	70-100 dB

Trends of Treatment and Outcomes for Laryngeal Cancer in USA



ASCO Practice Guideline for the Use of Larynx-Preservation Strategies in the Treatment of Laryngeal Cancer

Recommendations:

- All patients with T1 or T2 laryngeal cancer, with rare exception, should be treated initially with intent to preserve the larynx.
- For most patients with T3 or T4 disease without tumor invasion through cartilage into soft tissues, a larynx-preservation approach is an appropriate treatment option, and concurrent chemoradiation therapy is the most widely applicable approach.
- To ensure an optimum outcome, special expertise and a multidisciplinary team are necessary, and the team should fully discuss with the patient the advantages and disadvantages of larynx-preservation options compared with treatments that include total laryngectomy.

Journal of Clinical Oncology, 2006

