



Use of FEES (Fiberoptic Endoscopic Evaluation of Swallowing) in assessment and management of head and neck cancer patients

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Head and neck cancer (HNCA) statistics



- ~50,000 new cases in the US in 2010
- 1% of population will be diagnosed with HNCA in their lifetime
- HNCA accounts for 5% of cancer related deaths
- 5-year survival 60%

SEER database

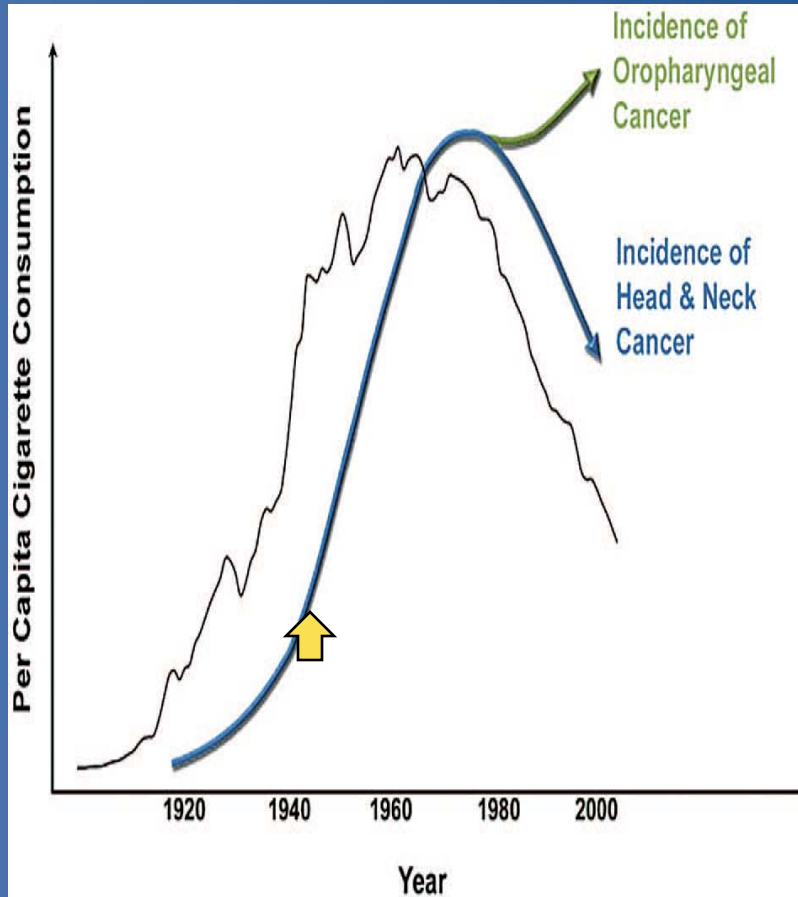
Possible Etiologies

- Tobacco & alcohol use
- Environmental exposure
- Reflux
- Just plain “bad luck”
- HPV (Human Papilloma Virus)
 - Type 16 & 18



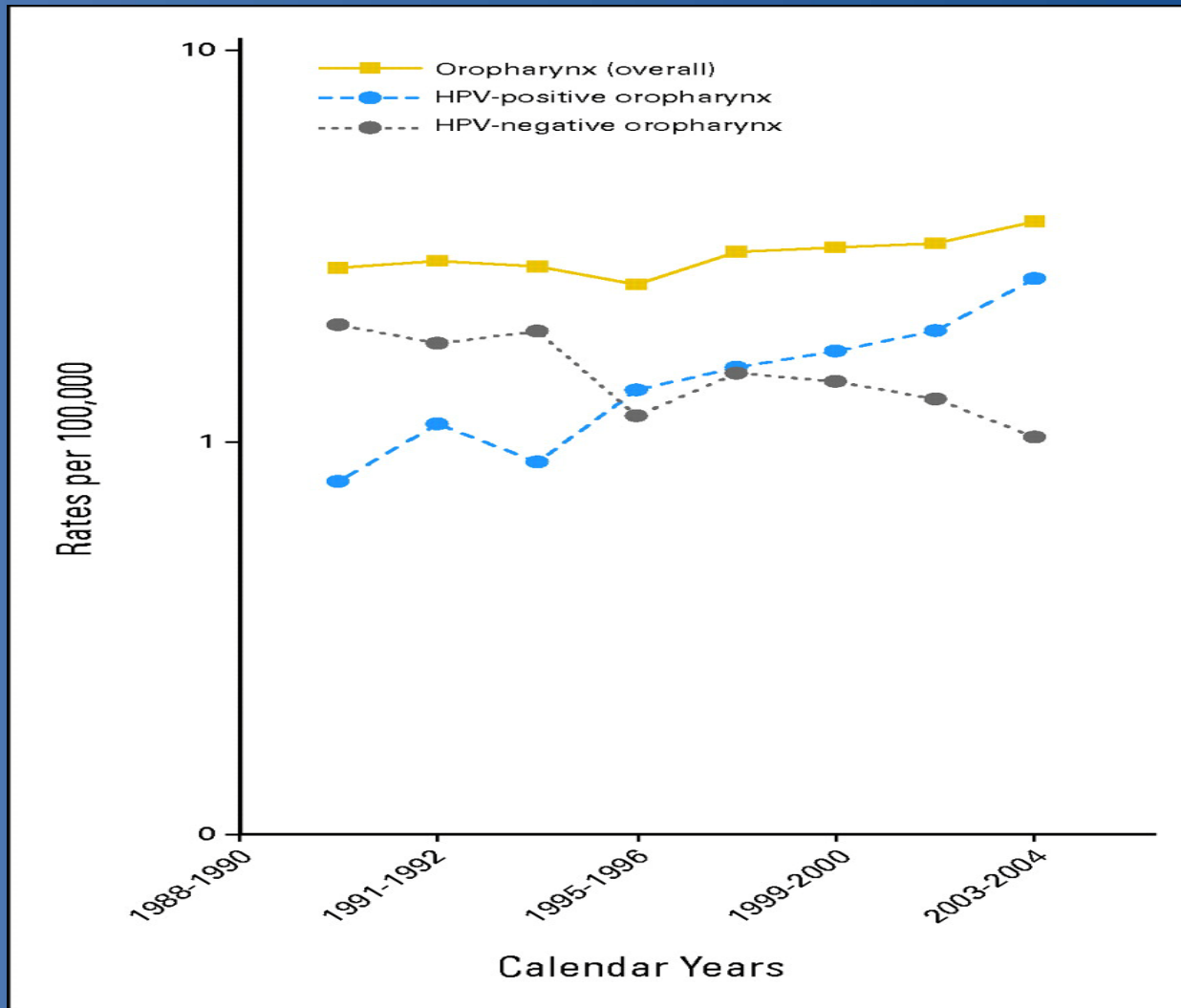
CALL: 1800-438-2000
92% OF ORAL CANCERS
SMOKING CAUSES

Changing demographics



- Declining incidence in all sub-sites other than oropharynx
- Proportion of HNCA associated with oropharyngeal tumors from 18-31% between 1973-2004

Changing demographics



Chaturvedi et al 2011

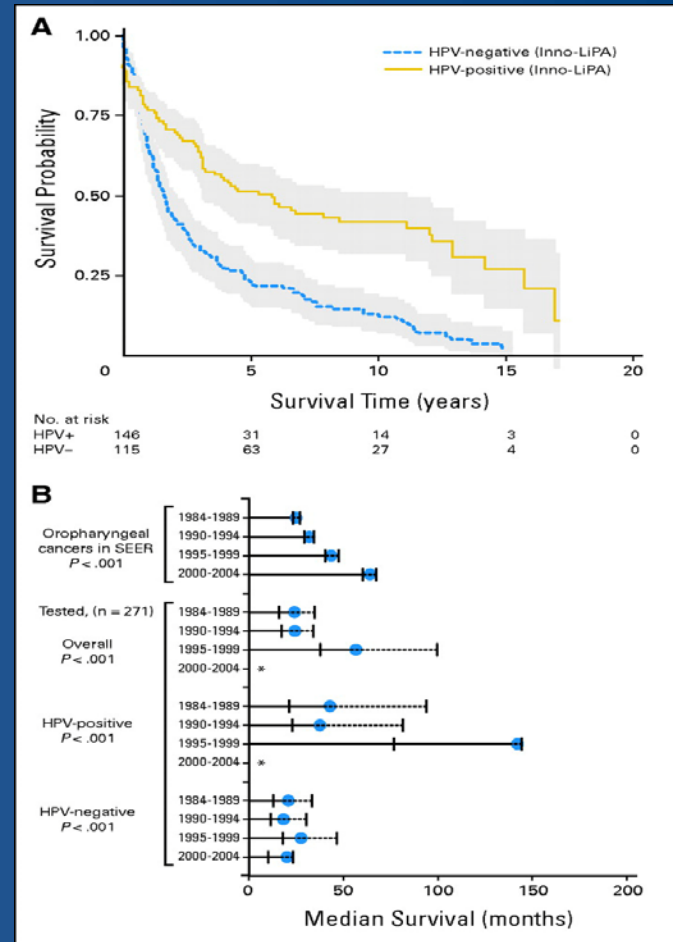
JOURNAL OF CLINICAL ONCOLOGY

Why does HPV matter?

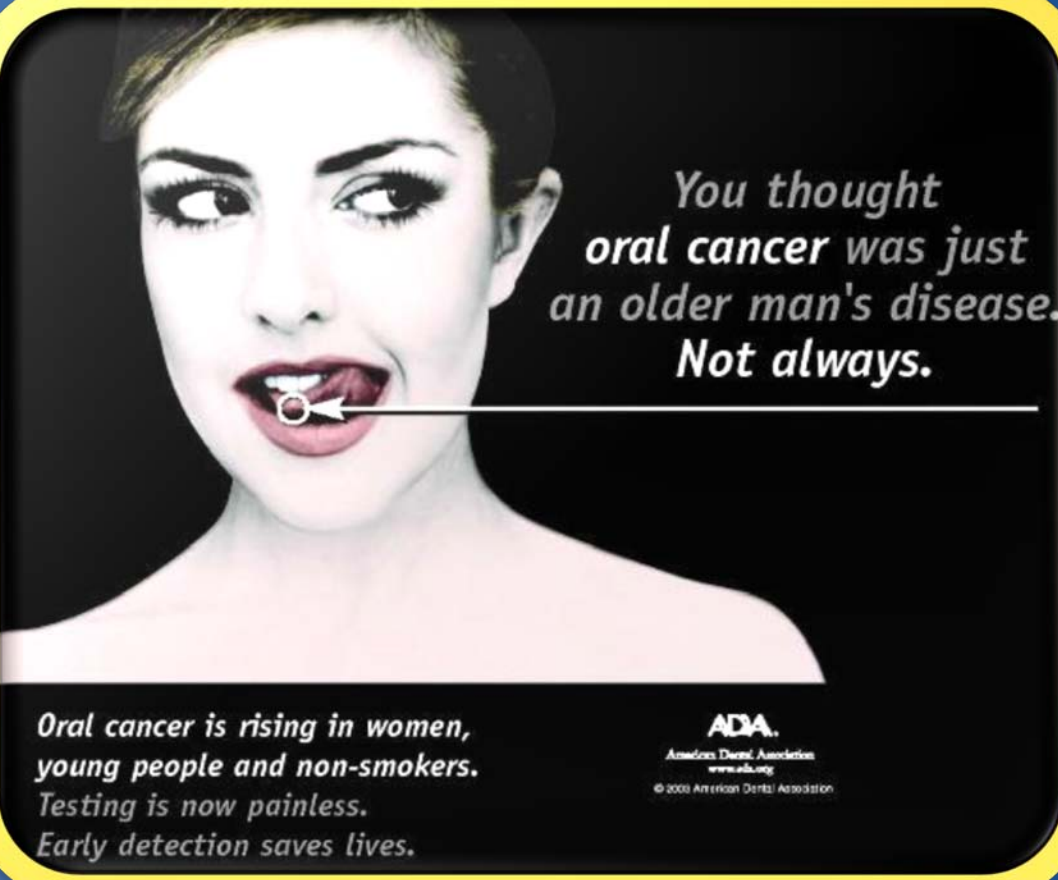
- Patients with HPV associated HNCA have different demographics and risk factors
- Potential for poorer outcomes related to delayed diagnosis
 - Absence of “traditional” risk factors cause pts to assume the best, not the worst.

Why else does HPV matter?

- Response to treatment **improves** in individuals with HPV associated HNCA



Chaturvedi et al 2011



*You thought
oral cancer was just
an older man's disease.
Not always.*

*Oral cancer is rising in women,
young people and non-smokers.
Testing is now painless.
Early detection saves lives.*

ADA.
American Dental Association
www.ada.org
© 2009 American Dental Association

- CDC approval/recommendations for Gardasil vaccine

- Girls, starting from 11-12 y.o. (since 2006)
- Boys, starting from 11-12 y.o. (since 2009)

What we know about pre-tx swallowing in HNCA

- Significantly different than normals in regards to:
 - Oral and pharyngeal transit times
 - Oral and pharyngeal residue
 - Cricopharyngeal opening
 - Oropharyngeal swallowing efficiency
 - Pauloski et al 2000

Pretreatment risk stratification



- Risk of swallowing disorders increases with:
 - Increased tumor stage
 - Hypopharyngeal tumors > laryngeal tumors > oropharyngeal tumors (though some disagreement about oropharynx vs. larynx)
 - Pauloski et al 2000, Stenson et al 2000

The disconnect

- High proportion of patients will detect a difference in their swallowing/eating
- **BUT** dysphagic complaints do not correlate with actual dysfunction
- **Patients tend to under estimate the degree of swallowing dysfunction**
- van der Molen et al 2009, Pauloski et al 2000

The conundrum

- Oncologic treatments may aggravate preexisting or introduce new deficits which may complicate safe and efficient oral intake
- Acute toxicities may impact desire and ability to tolerate oral intake
- Lazarus 2006, Gillespie et al 2005, Kotz et al 2004, Graner et al 2003

The solution

- Patients being treated for head and neck cancer should undergo instrumental swallowing assessment prior to treatment

Our rationale

- Early identification of dysfunction allows for implementation of compensatory strategies, dietary modifications, and/or direct swallowing therapy
- Opportunity to provide education and preventative intervention
- Findings may impact oncologic treatment decisions

Our preferred model



- Participation in a multidisciplinary assessment format
- Completion of FEES as part of the endoscopic patient evaluation

The multidisciplinary team



- Surgical oncologist
- Radiation oncologist
- Medical oncologist
- Speech-language pathologist

Multidisciplinary Care

- 2008 Practice guidelines consider multidisciplinary care as standard of care for head and neck cancer patients
 - NCCN (National Comprehensive Cancer Network)
 - ESMO (European Society of Medical Oncology)
 - AHNS (American Head and Neck Society)

Multidisciplinary Care

- Blair & Callender, 1994
 - Collaboration and communication of multidisciplinary teams have had a profound effect on the treatment of head and neck cancer
 - “Essential for positive outcomes”

Potential Benefits of Multidisciplinary Assessment



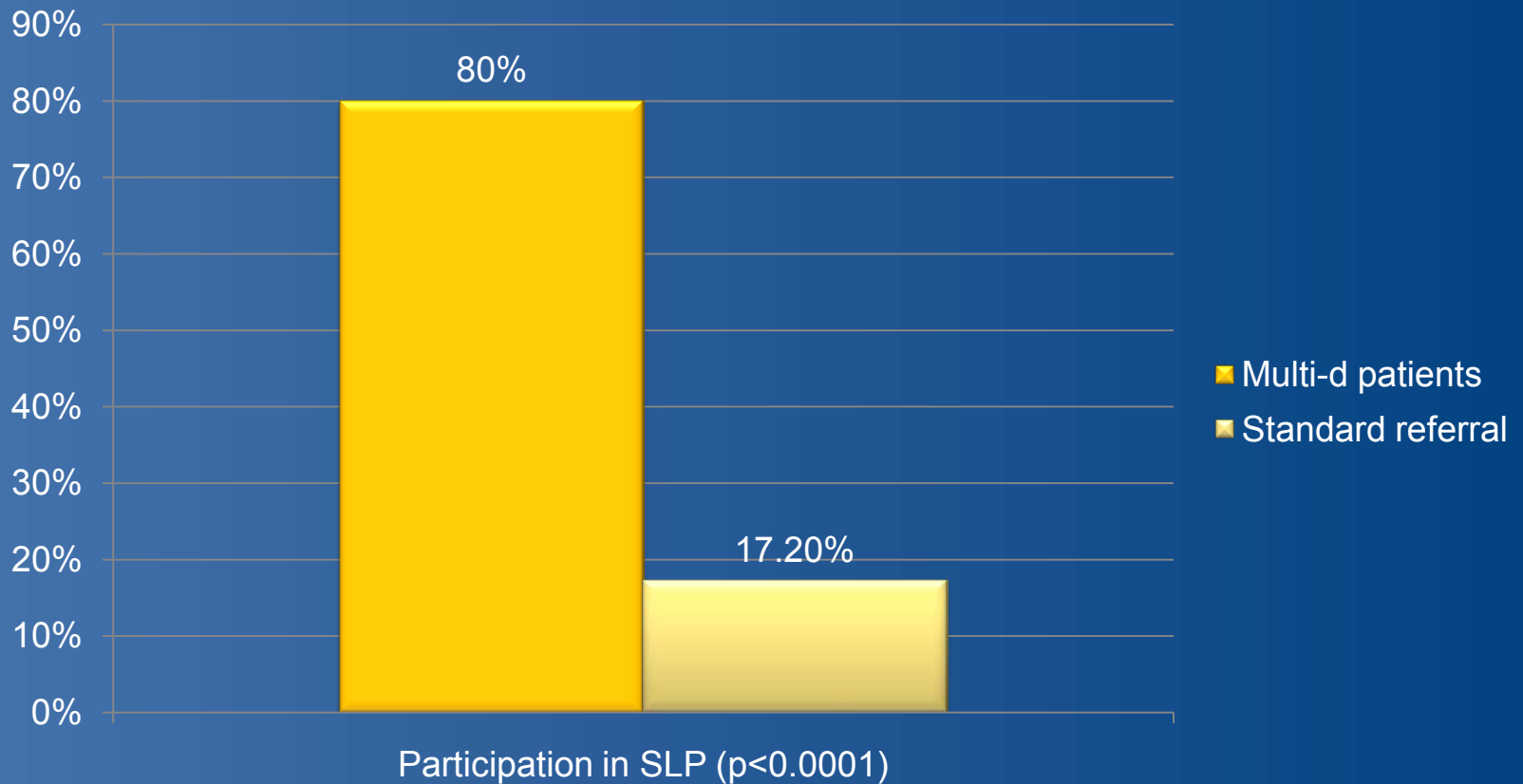
- Westin & Stalfors, 2008
 - Built in second opinion for treatment planning
 - Education
 - Increased consideration of ethics and QOL
 - Cost efficiency
 - Coordination of care
 - Improved patient outcomes

Benefits of multidisciplinary clinic model specific to HNCA

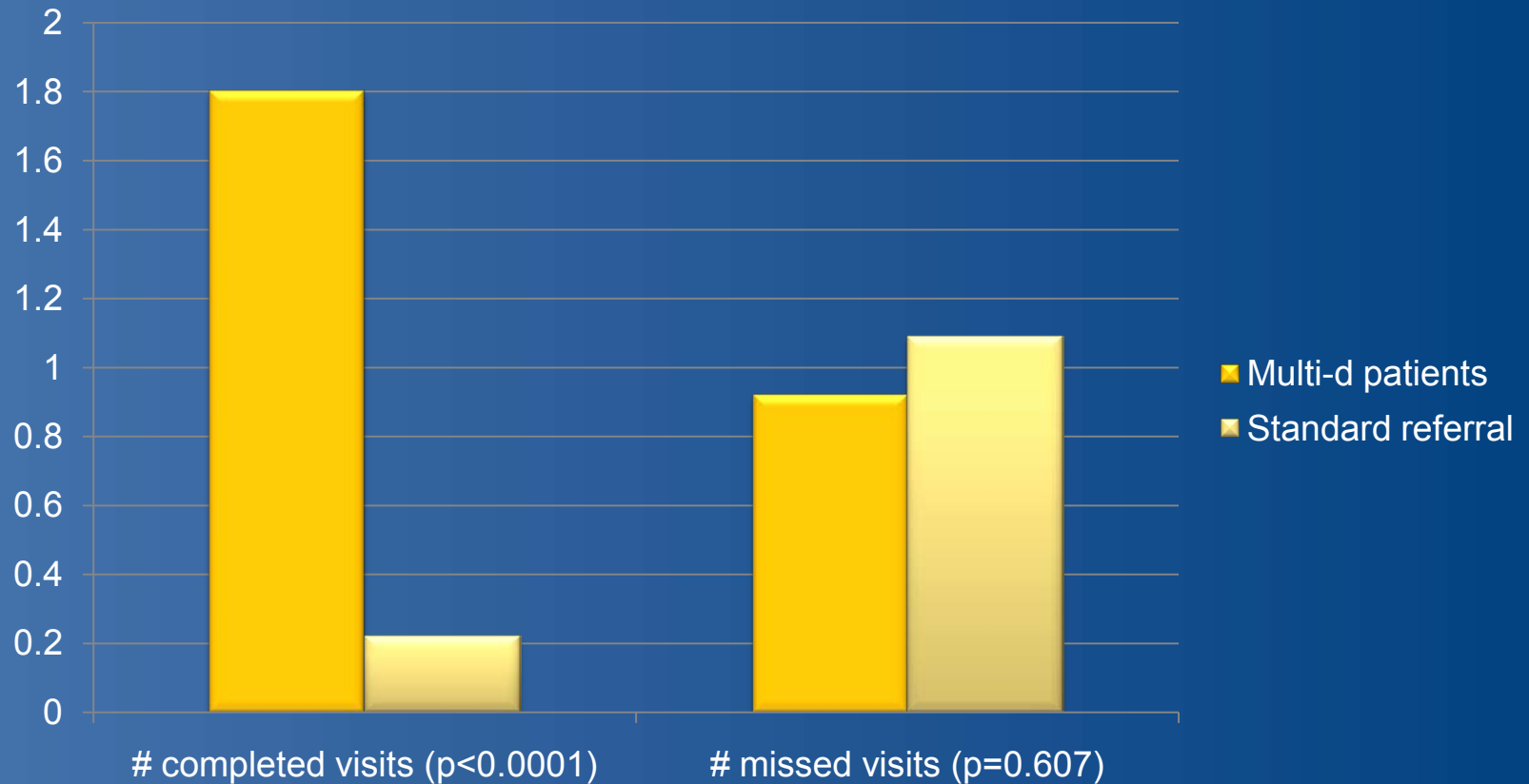


- Patients evaluated in a multidisciplinary format significantly more likely to comply with SLP recommendations
- Starmer et al 2011

Participation in SLP care by referral pattern



SLP visits by referral pattern



SLP role during the multidisciplinary assessment



- Obtain history regarding communication and swallowing difficulties
- Clinical evaluation of speech, voice, maximal jaw opening, oral motor function
- Evaluation of swallowing function (FEES)
- Education and intervention

Rationale for FEES exam

- Silent dysfunction is common
- Assessment of secretion management
- Visualization of tumor impact on swallowing function
- Identification of swallowing deficits and their impact on safety and efficiency
- Opportunity to assess the impact of compensatory strategies and diet modifications

Case example

- 66 yo gentleman with a history of FOM CA, lung CA, and recurrent supraglottic SCCA
- s/p composite resection, neck dissection, lobectomy, radiation X2 (neck & larynx)
- Being considered for robot-assisted supraglottic laryngectomy

Pre-treatment FEES



The results

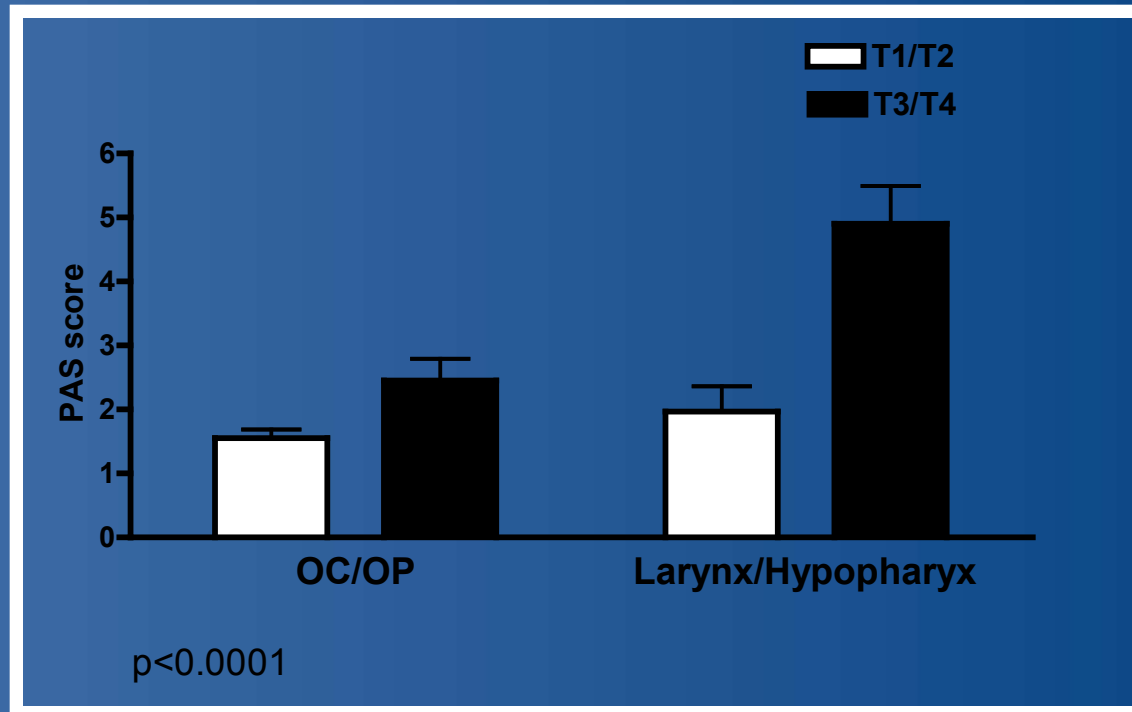
- Patient advised by surgeon to undergo total laryngectomy due to severity of dysphagia
- Patient insisted upon supraglottic laryngectomy
- Post-op patient with severe dysphagia, aspiration, and aspiration pneumonia X2
- Total laryngectomy completed due to dysphagia

Our findings for a large cohort of HNCA patients (n=204)

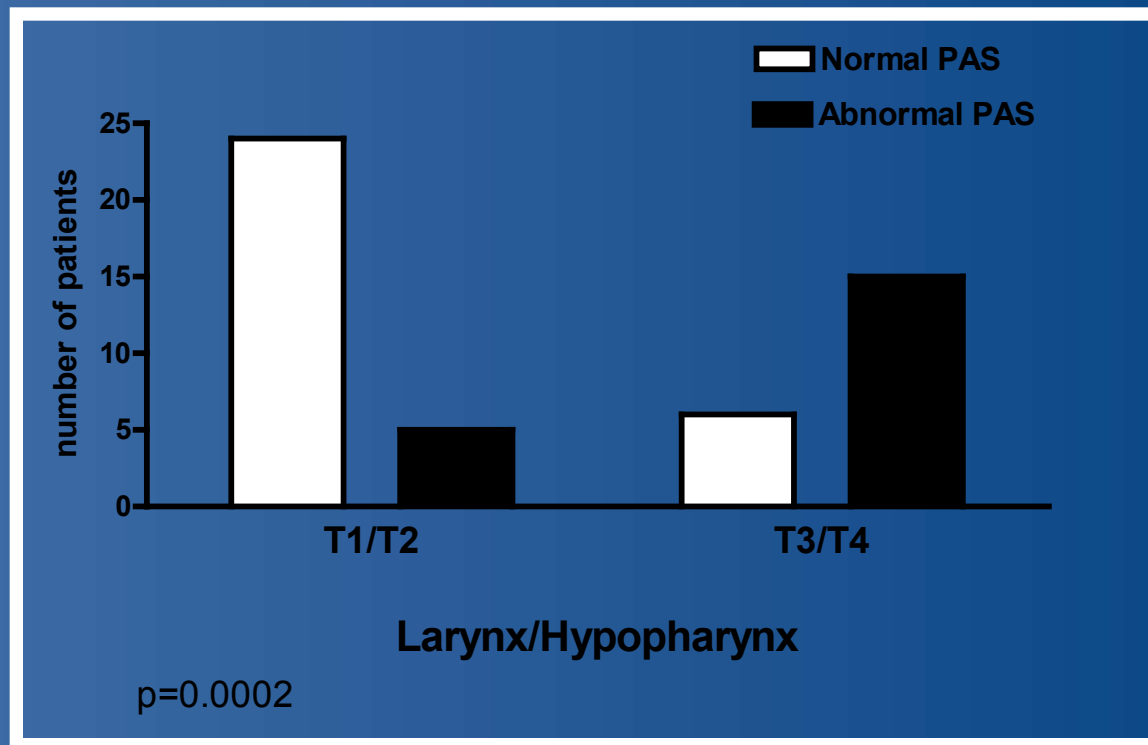


Age	< 60 years	120 (59%)
	≥ 60 years	84 (41%)
Sex	Male	169 (83%)
Race	Black	158 (77%)
	White	36 (18%)
	Other	10 (5%)
T-Stage	T1/2	138 (68%)
Primary site	Oral cavity	41 (20%)
	Oropharynx	97 (48%)
	Larynx	44 (22%)
	Hypopharynx	8 (4%)
	Nasopharynx	9 (4%)

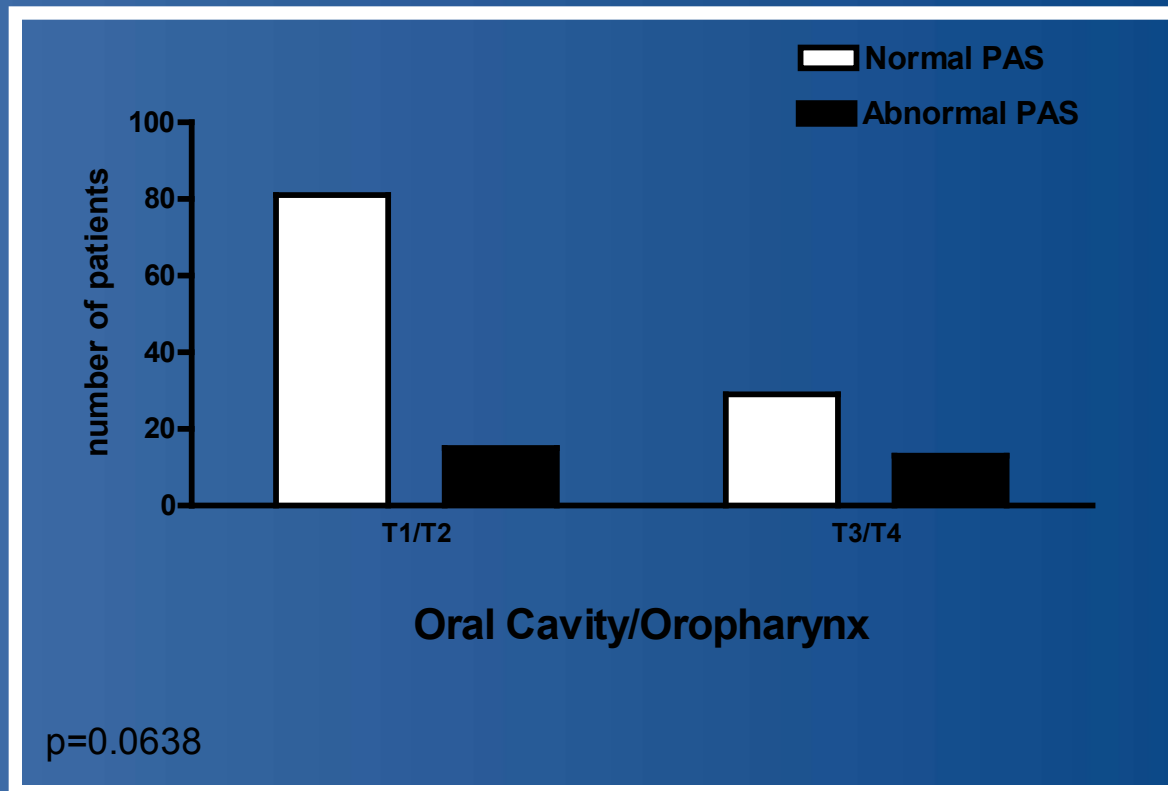
Pretreatment PAS score by tumor site and stage



Pretreatment PAS category by T stage (hypopharynx/larynx)



Pretreatment PAS category by T stage (oral cavity/oropharynx)



Pretreatment FEES procedure



- Evaluate velopharyngeal closure
- Observe for pooling of secretions and/or aspiration of secretions
- Observe anatomy and make basic judgments about symmetry or abnormalities
- Assess vocal fold mobility and glottic closure during phonation
- Assess during dry swallow and cough
- Evaluate efficiency of pharyngeal clearance and risk for airway infiltration

Secretion severity

- Pts rated ≥ 2 more likely to aspirate when given food/liquid (Murray et al, 1996)

Rating	Description
0	Normal
1	Secretions evident upon visualization but <u>not</u> in vestibule.
2	Change from a 1 to a 3 during observation
3	Any secretions in the laryngeal vestibule

Secretion severity

- Mean score non-aspirators = 2
- Mean score aspirators = 3.71
(Donzelli et al, 2003)

Rating	Description
1	Thin, clear secretions; <10% pooling in vallecula or pyriform
2	10-25% pooling in vallecula or pyriform
3	>25% pooling in vallecula or pyriform
4	Laryngeal penetration of secretions above TVC
5	Secretions on TVC's and/or tracheal aspiration

Secretion severity

- Donzelli's scoring reduced to 3-point scale

Rating	Description
1	<u>Pooling</u> in vallecula or pyriform
2	Laryngeal <u>penetration</u> of secretions above TVC
3	Secretions on TVC's and/or tracheal <u>aspiration</u>

Bolus presentations

- Start with viscosity which is most likely to be safe for that patient
- Endoscope should be positioned in the region of the oropharynx to assess for timeliness of swallow
- After swallow is completed, endoscope can be passed to the laryngeal vestibule to assess for aspiration

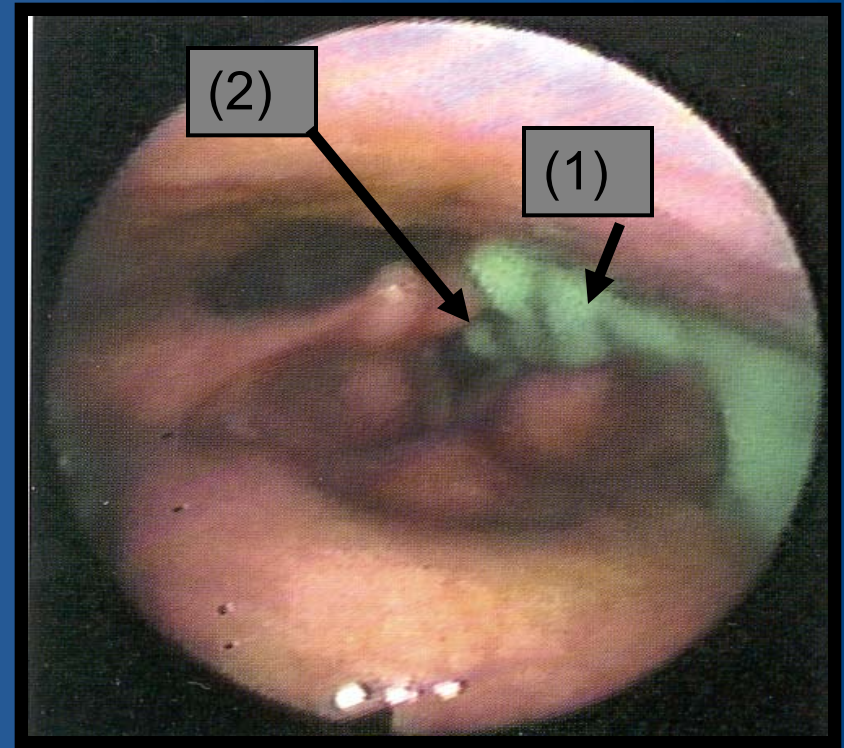
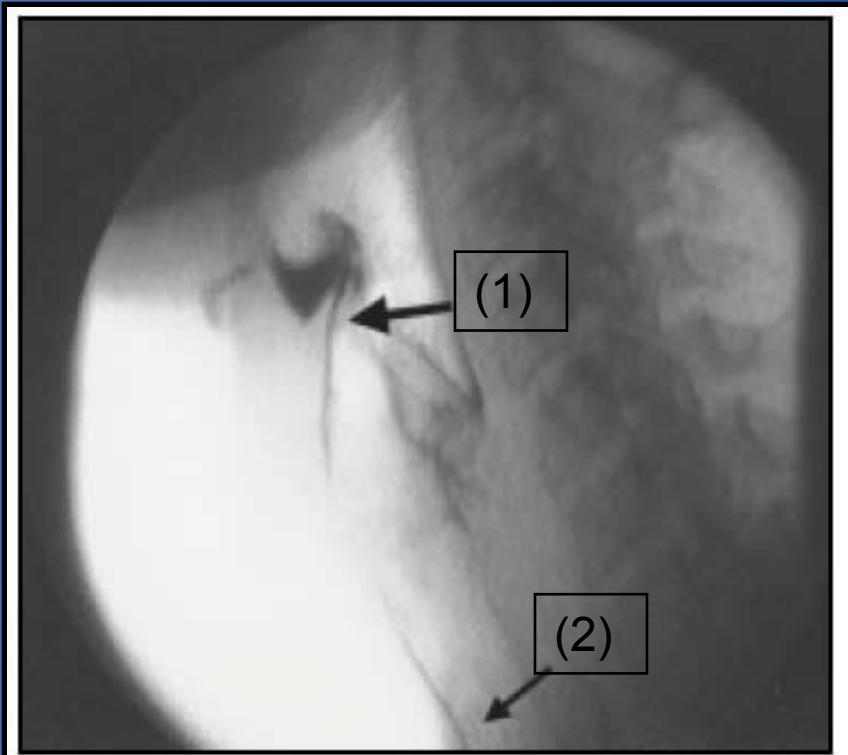
Penetration Aspiration Scale



1. Does not enter airway
2. Enters airway, remains above vocal folds, is ejected
3. Enters airway, remains above vocal folds, is not ejected
4. Enters airway, contacts vocal folds, is ejected
5. Enters airway, contacts vocal folds, is not ejected
6. Enters airway, below vocal folds, expelled out or into laryngeal vestibule
7. Enters airway, below vocal folds, not ejected despite effort
8. Enters airway, below vocal folds, no effort to eject

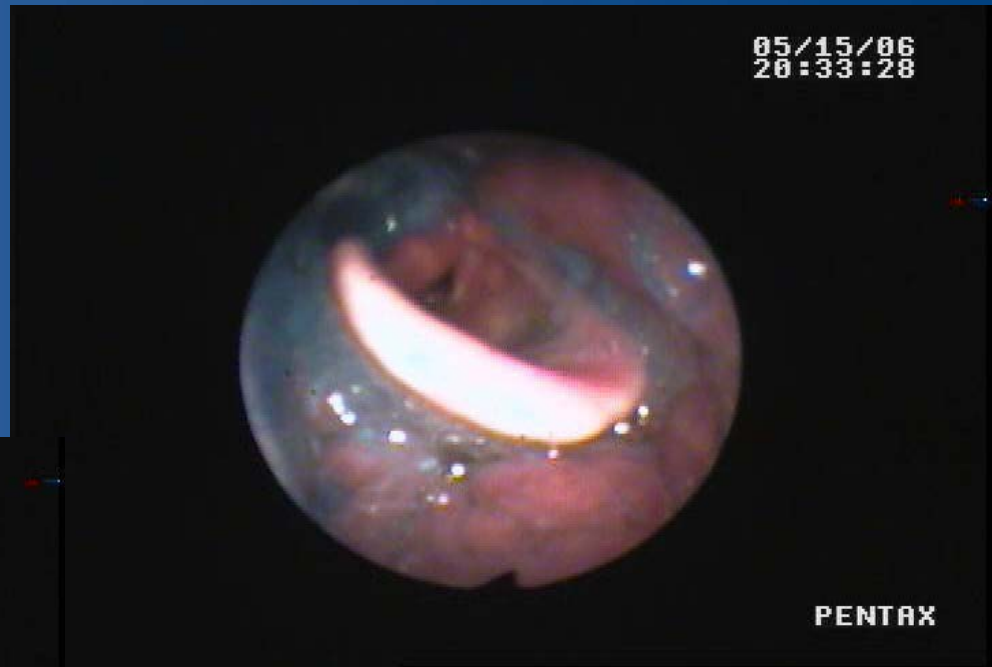
Rosenbek et al, 1996

Penetration & Aspiration



Penetration (1) AND aspiration (2)

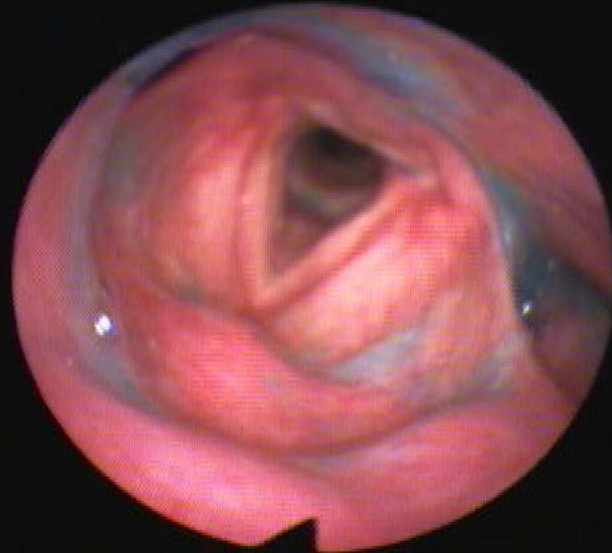
Penetration



Aspiration

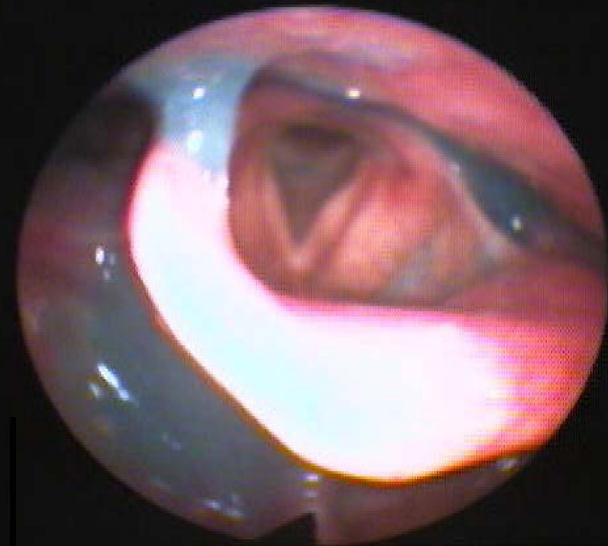


06/26/06
20:22:38



PENTAX

06/26/06
20:22:45



PENTAX

06/26/06
20:22:18



PENTAX

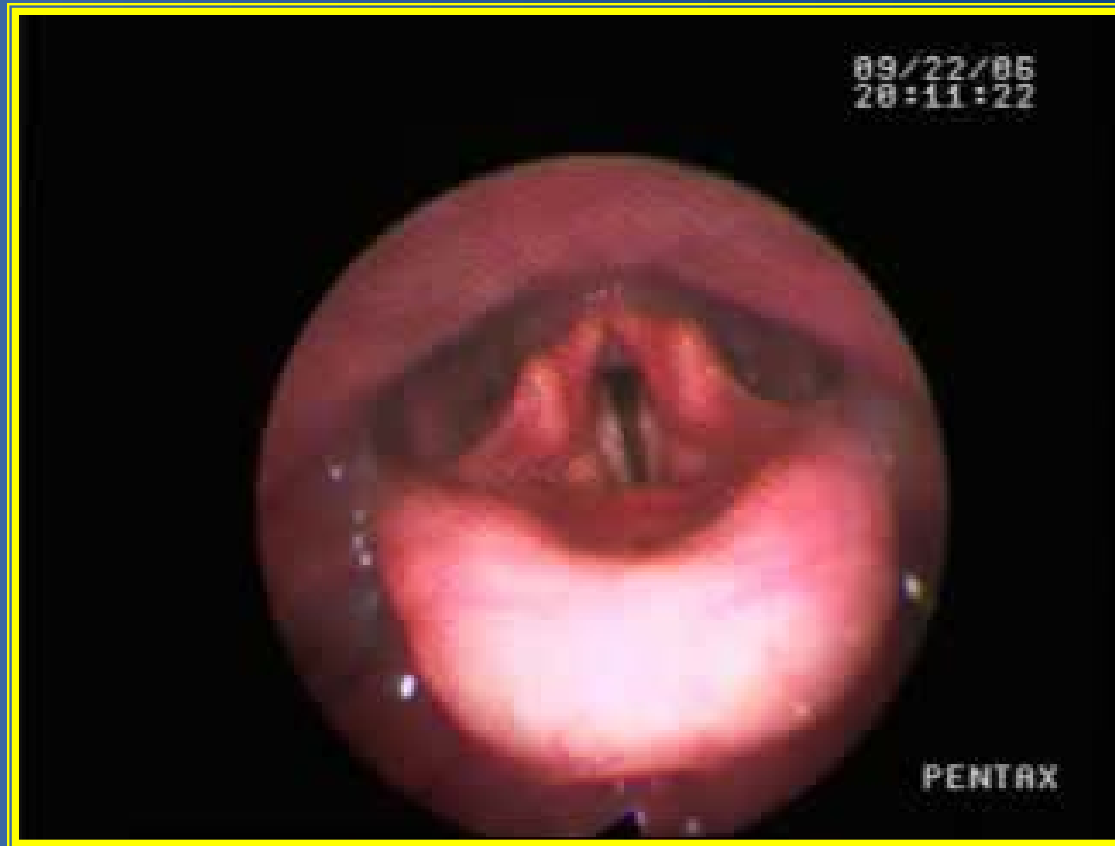
PAS in FEES (Colodny, 2002)

- FEES more reliable for assessing Penetration than MBSS
- MBSS more reliable for detecting severity/depth of aspiration
- BOTH techniques equally effective for discriminating between pen/asp
- FEES just as reliable as MBSS when using PAS

FEEES for biofeedback



Supraglottic swallow



Practicing SGS with Endoscopic Biofeedback



Practicing SGS with Endoscopic Biofeedback



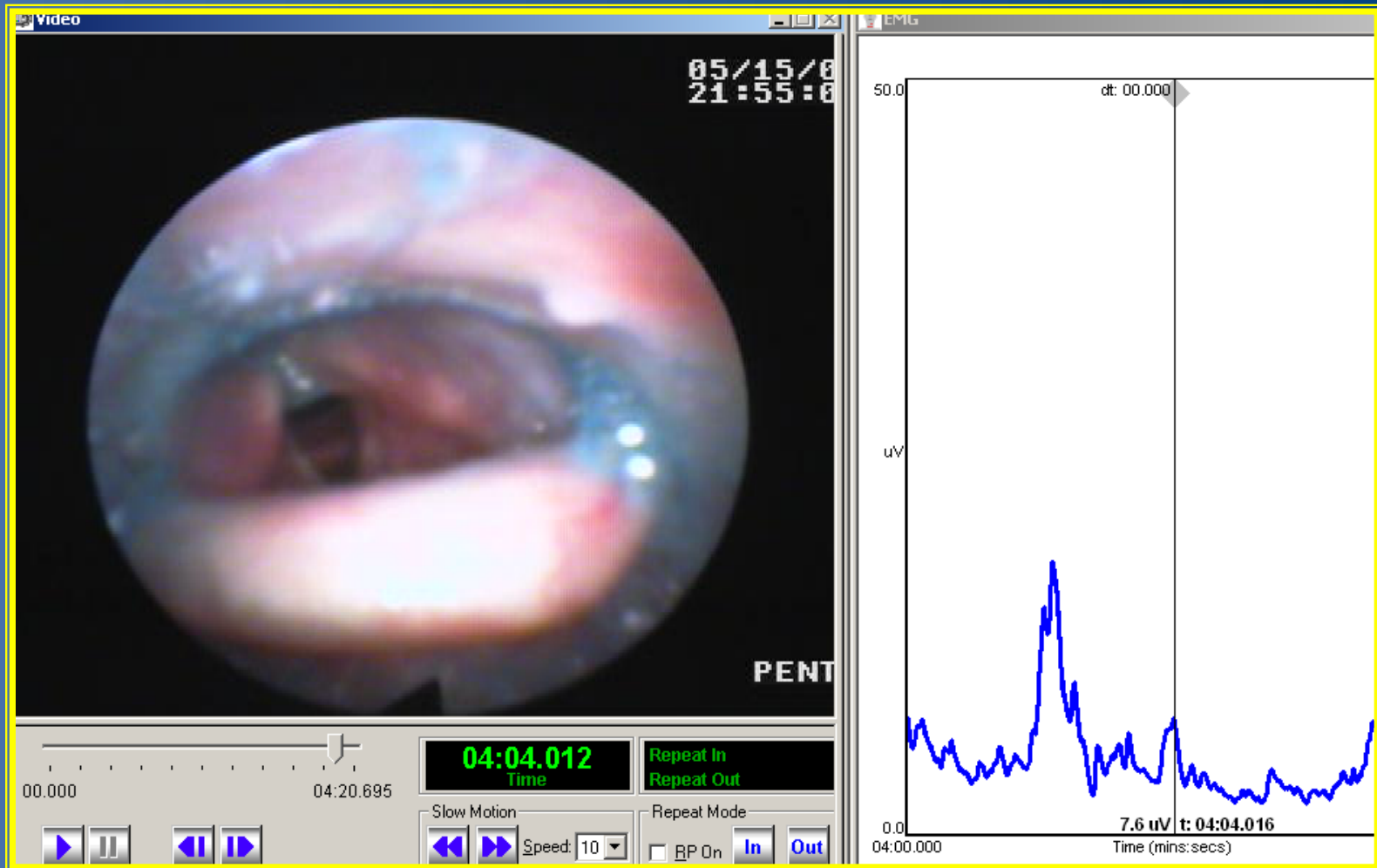
- Anatomical changes
 - Understanding for doing technique
- Awareness of sensory changes
- Proper performance of technique

Head turn following asensate flap reconstruction



- Degree of head turn
- Awareness of physiology
- Awareness of residue

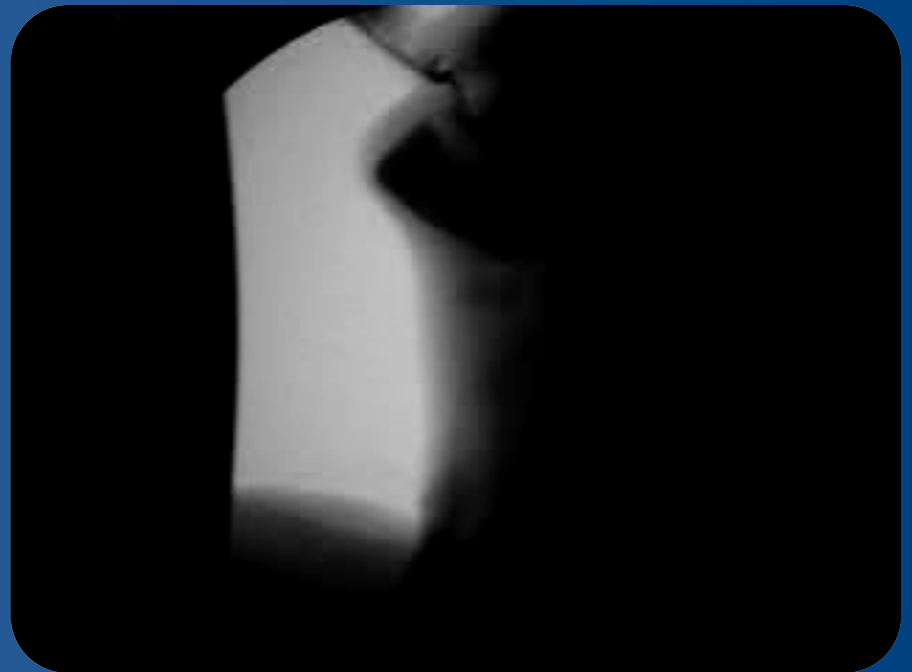
FEES combined with sEMG biofeedback



Early effects



6E118X



Late effects

Same patient from previous MBSS

- Note the different information obtained in each exam
- Also provided additional information to provide to ENT



MBSS and FEES??

- MBSS & FEES both have different strengths
- Both MBSS & FEES may be warranted
- When one exam yields unusual findings that cannot be fully appreciated
- When one exam does not answer all clinical questions
- Unique circumstances of H&N Ca may be better evaluated with FEES

Thank you for your attention.



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