

Postoperative Rehabilitation

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1. Pretreatment planning

Treatment selection as the first line of rehabilitation

- Functional deficits differs in partial, total laryngectomy or RTx
- Extent of speech and swallowing impairment in oral & oropharyngeal cancer

- 1) Amount of oral tongue or tongue base resected
- 2) Nature of the surgical reconstruction :

– Rehabilitation begins with treatment planning

Team : surgeon, medical oncologist, radiation oncologist, rehabilitation specialist (SLP, maxillofacial prosthodontist)

2. Pretreatment counseling

Speech & swallowing assessment

Dental consultation

Psychological assessment

3. Posttreatment counseling

Depend on the patients condition (postop 2–3 days)

– Both medical and psychological

4. Postoperative assessment

WHEN healing is complete (postop. 7th to 14th days)

– Initial assessment :

- 1) Oral structures
- 2) Range of motion of the tongue and jaw
- 3) Oral sensation
- 4) Articulation, intelligibility, resonance - speech
- 5) Gag and swallow reflex, sign of aspiration - swallow
- 6) Nutritional status

– Videofluoroscopic evaluation

In radiation therapy patient rehabilitation throughout radiation therapy and thereafter

5. Speech treatment

Daily while hospitalized, and weekly following discharge

The specific exercises depend on the extent impairment

- 1) Range of motion exercises :

To increase vertical and ap lingual movement, lateral and horizontal movement of mandible

- 2) Exercises to increase strength of the tongue :

Focus on lateralization and elevation, both the tip and dorsum of tongue, use a tongue depressor

- Frequency and duration of exercise sessions :

Practice 2 to 3 min at a time 5 to 10 times a day. For a month or more, if radiation tx, through and additional 6 weeks.

- 3) Articulation

Requires a complete analysis of sound production

To arrive at the most acceptable target sound through use of patients residual structure when more than 50% of the tongue has been resected, delayed until appropriate prosthetic appliance is fitted.

- Intraoral prosthetics :

– Reshape the oral cavity so that the residual tongue mass may function with maximum effectiveness.

– Fill the tissue defects making contact between residual structures and the prosthesis.

Optimal timing :

- 1) Maxillary prosthesis : 4–6 weeks after healing is complete

- 2) Lar prosthesis : same, but if radiation therapy, postpone after irradiation

6. Swallowing treatment

Swallowing assessment should be done prior to removal of the nasogastric feeding tube.

If no aspiration and acceptable time frame (10 sec ↓), remove nasogastric tube and taking liquids and pureed

If swallowing function is disturbed, keep nasogastric tube and perform MBS.

Diagnostic Techniques in Swallowing Disorders

- 1) Videofluoroscopy
- 2) Videoendoscopy
- 3) Ultrasound

- 4) Scientigraphy
- 5) pharyngeal manometry

Rehabilitation Method

- 1) Postural change
- 2) Increased sensory input
- 3) Swallow maneuver
- 4) Diet change
- 5) Muscle exercise
- 6) Intraoral prosthesis
- 7) Surgical procedure

1. Postural technique

- 1) Chin down : delayed pharyngeal swallow, reduced airway closure, reduced posterior tongue movement
- 2) Head back : inefficient oral transit
- 3) Head turned : unilateral pharyngeal weakness, unilateral laryngeal weakness, cricopharyngeal dysfunction
- 4) Head tilt : unilateral oral and pharyngeal dysfunction
- 5) lying down : pharyngeal residue due to reduced pharyngeal contraction or reduced laryngeal elevation

2. Increased sensory input

Delayed oral onset, apraxia, reduced oral sensation, delayed pharyngeal swallow

- 1) Increased pressure on tongue
- 2) Changing bolus taste, temperature, volume (sour, cold, large)
- 3) Self feeding
- 4) Thermal/tactile stimulation dip laryngeal mirror into a ice water for 10 sec. vertically rubbing the ant. faucial about 4-5 times on each side remove the mirror and swallow

3. Swallow maneuver

- 1) Effortful swallow : reduced tongue base retraction swallow normally, but squeeze very hard with all of your tongue and throat muscle while you swallow
- 2) Mendelsohn maneuver : reduced laryngeal movement & cp opening swallow normally when you feel your voice box go up, grab it with your throat muscle and don't let it go down
- 3) Supraglottic swallow : reduced vocal fold closure, delayed pharyngeal swallow hold your breath continue to hold your breath and swallow immediately after the swallow, cough
- 4) Supersupraglottic swallow: reduced closure of laryngeal entrance hold your breath very tightly and bear down continue to hold your breath and swallow immediately after the

swallow, cough

4. Diet change

- 1) Poor oral control : thick liquid → thin liquid
- 2) Delayed pharyngeal swallow : thick liquid and thicker foods
- 3) Reduced closure of the laryngeal entrance : pudding and thick food
- 4) Reduced tongue base & pharyngeal wall contraction : liquid
- 5) Reduced laryngeal elevation & cricopharyngeal opening : liquid

5. Range of motion exercise

- 1) Lips
- 2) Tongue
- 3) Jaw
- 4) Laryngeal elevation
- 5) Adduction exercise
- 6) Shaker exercise

6. Intraoral prosthesis

- 1) Palatal lift prosthesis : velar paralysis
- 2) Palatal obturator : soft palate resection
- 3) Palatal reshaping prosthesis : tongue resection (50%?)

Management of the Tracheostomy Tube

- Deflate the tracheostomy cuff prior to swallowing
- Suction both orally and via the tracheostomy
- Occlude tracheostomy tube
- Inflated tracheostomy tube
 - Restriction laryngeal elevation (Bonanno, 1971)
 - Reducing laryngeal sensitivity (Feldman, 1966)
- Occlusion of tracheostomy tube during swallowing
 - Airflow through larynx ↑ → stimulate subglottic sensory Receptor → improve vocal fold closure (Shin 1998)
 - Reduction a elimination of aspiration (Muz. 1994)
- Initiating swallowing therapy with tracheostomy tube
 - Advantage
 - 1) Observe aspiration more directly
 - 2) Elimination of aspirated material more easily
 - Disadvantage
 - 1) Restriction of upward laryngeal movement
 - 2) Compression of esophagus.
 - 3) Change in intratracheal pressure.
- The blue dye test
 - Screening test for the presence of aspiration at the bedside for a tracheotomized patient.

Swallow various foods and liquids containing blue dye
Blue dye from tracheostomy site - indication of aspiration

Swallowing Disorders and Management after Specific Surgical Resection

1. Partial glossectomy

1) Small resection (50% ↓) and limited to tongue delayed triggering the pharyngeal swallow (short term)

- Thermal tactile stimulation
- Range of motion tongue exercise
- Exercise to control the bolus

2) 50% ↑ resection

Reduced lingual propulsion and control in the mouth

- Liquid or thinned paste consistency
- Tilting the head backward during swallow
- Supraglottic swallow
- Range of motion tongue exercise
- Intraoral maxillary reshaping prosthesis

2. Anterior floor of mouth resection

1) Marginal mandibulectomy with floor of mouth resection

Relatively good lingual control & propulsion
Initial period - positioning the food posteriorly
Later - dental prosthesis

2) Marginal mandibulectomy with floor of mouth resection & tongue flap reconstruction (near total or total glossectomy) difficult oral control, propulsion of bolus & mastication reduced laryngeal or pharyngeal control

- Liquid or paste into the back of the oral cavity
- Dump and swallow
- Prolonged supraglottic swallow

3) Composite resection (FOM, mandible, tongue) swallowing disorders depend on reconstruction method, extent of tongue resection, FOM resection or not

4) Management of tongue flap reconstruction tongue range of motion exercise food position posteriorly tilting head backward during swallow palatal reshaping prosthesis

5) FOM muscle resection reduced laryngeal elevation
- Laryngeal elevation exercise (Mendelsohn maneuver, falsetto exercise)

3. Lateral floor of mouth with posterior composite resection

Difficulties in oral preparation, oral and pharyngeal stage swallow :

- Reduced lingual control (aspiration before swallow)
- Delayed pharyngeal swallow (asp. before swallow)

Reduced tongue base retraction

Reduced pharyngeal wall contraction (asp. after swallow)

Nasal regurgitation - extended to soft palate

- Improve oral and tongue base range of motion
- Triggering pharyngeal swallow
- Promote airway protection
- Clearing pharyngeal residue
- Maxillary reshaping prosthesis

4. Laryngectomy

1) Horizontal partial laryngectomy

Extent of resection: hyoid bone, epiglottis, A-E fold, false cord

Swallowing disorder : delayed reflex, decreased vocal fold adduction, reduced laryngeal elevation & pharyngeal peristalsis

Rehabilitation : super-supraglottic swallow tongue base exercise, Mendelsohn maneuver adduction exercise

Problem : extended resection (tongue base, one arytenoid) radiation therapy

2) Vertical partial laryngectomy

Extent of resection : one vocal cord & false cord, thyroid cartilage arytenoid (extension)

Swallowing disorder : aspiration during pharyngeal swallow (mild)

Rehabilitation : chin down & head rotation

Extended resection : super-supraglottic swallow adduction exercise

3) Total laryngectomy

Postop 1wk : liquid diet

Postop 2wk : soft diet

Swallowing disorder : pseudoepiglottis stricture at distal end of pharyngeal repair leakage around TE puncture reflux

Voice rehabilitation

a) Esophageal voice

b) Fistula-based voice :

Primary or secondary tracheoesophageal puncture

Bloom-Singer prosthesis, Provox

c) External vibratory device: electrical or pneumatic

5. Radiation therapy

1) Oral cavity ; xerostomia, edema, mucositis

- Delayed oral transit time delayed triggering pharyngeal swallow

2) Pharynx

- Reduced tongue base retraction pharyngeal contraction laryngeal elevation

: Residue in pharynx, aspiration after swallow

- Super-supraglottic swallow, Mendelsohn maneuver, effortless swallow
- Range of motion exercise for the tongue, jaw, larynx from before to months after radiation therapy

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