The use of metallic expandable tracheal stents in the management of inoperable malignant tracheal obstruction

Alaa Gaafar-MD, Ahmed Youssef-MD, Mohamed Elhadidi-MD

Alexandria Faculty of Medicine, Egypt

Tracheal Tumors

Tracheal neoplasms account for < 1% of all malignancies. In spite of their low incidence, these tumors represent potentially lethal phenomena.
Tracheal Tumors

- Rare tumors (1 person/100,000 pop.)
- Laryngeal cancer 60 times more common.
- Malignant 80-90%.
- Metachronus lesions in 40% (oropharynx, larynx and lung)
- Males : Females = 3:1
- More common 5th and 6th decades of life.

Malignant Tracheal Tumors

**Primary:**
- Squamous cell carcinoma.
- Adenoid cystic carcinoma.
- Other. \[75%\]

**Secondary: (more common)**
- Laryngeal carcinoma.
- Esophageal cancer.
- Thyroid cancer.
- Lung carcinoma.
Clinical Presentation

Early: *(Non specific)*
- Shortness of breath after activity.
- Cough.
- Repeated attacks of pneumonia.

Late:
- Airway obstruction (>75% lumen obstruction).
- Haemoptysis.
- Hoarseness of voice, dysphagia.

Dilemma of Presentation

Rare Disease

Early non-specific manifestations

Late diagnosis (8m)

Locally advanced on presentation

Misdiagnosis
- Chronic bronchitis
- Bronchial asthma
- Heart failure
- FB (in children)
How to maintain airway?

1. Tracheostomy.
2. Bronchoscopic debulking.
3. Laser debulking.
4. Stenting:
   - Silastic.
   - Metallic expandable.

Limitations:
- Not for lower tracheal obst.
- Phonation.
- Quality of life.
# How to maintain airway?

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| **Limitations:**  
  - Risk of bleeding.  
  - Rapid re-growth.

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| 3. **Laser debulking.**  
| 4. Stenting:  
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  - Metallic expandable.  
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  - Risk of bleeding.  
  - Re-growth.  
  - Not for external compression.
**How to maintain airway?**

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### Metallic Expandable Stents

They were designed for dilation of great vessels in cases of external compression. The use of metallic stents in the treatment of tracheobronchial stenosis has been proposed for the first time in 1986.
Nitinol Expandable Stents

Metallic Expandable Stents: Advantages

1. Do not need tracheotomy.
2. Allow for mucociliary clearance.
3. Incorporated in the airway wall covered with function neoepithelium.
4. Resist airway collapse.
5. Easily inserted under LA (flexible bronchoscope) or GA (rigid bronchoscope).
Metallic Expandable Stents: Indications

1. Benign stricture with contraindication for open surgery.
2. Tracheomalacia.
3. External compression.
4. Malignant tracheobronchial obstruction. *(covered)*
5. Tracheo-esophageal fistula. *(covered)*
Patients

Twelve patients:
- Male : Female = 8 – 4
- Age: 43 – 71 years (mean = 61 years)

Presentation:
- Severe Airway Obstruction = 12 cases (3 cases were intubated)
- Dysphagia = 4 cases.
- Hoarseness of voice = 2 cases.

Pathology

- SCC
- ACC
- Esophageal
- Thyroid
Preoperative evaluation: CT scanning

Preoperative evaluation: Bronchoscopy
Operative Steps

- General anesthesia.
  Boluses or infusion of propofol with short acting muscle relaxants.
- Rigid Bronchoscope:
  Control airway - Manipulation of stent.
- Debulking & Dilatation = *laser, forceps*.
  4 mm lumen for insertion of stent.

**Tumors compressing but NOT infiltrating the trachea → NO debulking**

- Stent insertion.

Stent selection

- Ultraflex® expandable tracheal stent.
- Covered type.
- Length: 1 cm > length of tumor (4 – 6 cm)
- Diameter:
  Male: 18 - 20 mm.  Female: 16 - 18 mm.
Stent Insertion

Postoperative Care

- X-ray, CT scan.
- Medical treatment:
  - Antibiotic.
  - Corticosteroid: Systemic – Inhalation.
  - Mucolytic.
- Discharge after 5 days.
- Follow-up every 2 weeks (*flexible bronchoscopy ± CT*)
Results

• Intraoperative:
  o Stent was easily inserted.
  o Mild controllable bleeding.

• Postoperative:
  o Stent was well tolerated.
  o Irritating cough in the first 24 hours.
  o Immediate improvement of respiration.
  o Previously intubated patients (3) →
    Two were immediately extubated.  One was extubated 48 hours later.

Case 1 – Esophageal Carcinoma
Case 2 – Esophageal Carcinoma
Case 3 – Adenoid Cystic Carcinoma
Complications

- Intraoperative mild bleeding = 4 cases
- Transient cough = 12 cases.
- Granulation tissue formation = 7 cases.
- Retentions of secretions = 4 cases.
- Migration of the stent = 1 case.
- Growth of tumor at lower end of stent = 1 case.
Metallic expandable tracheal stents are good alternative for **palliative relief of airway obstruction** in MTT:

- It is a safe procedure.
- It provides secured patent airway.
- It avoids tracheostomy.
- It preserves the quality of life of patient.
- It gives patient chance for adjuvant treatment like radiotherapy or chemotherapy.

For application of the stent, Rigid bronchoscopy is more safe.

Follow up of patients is mandatory for early management of suspected complications.
Thank You

Alaa GAAFAR
Ahmed YOUSSEF
Mohamed HADIDI