

# Le complicanze della tracheotomia

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## Complicanze da tracheotomia

Classificazione per:

- tempo di comparsa
- gravità

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## Complicanze da tracheotomia: classificazione per timing

|         |  |
|---------|--|
| Immedie | durante la procedura di tracheotomia       |
| Precoci | si evidenziano 24-48 ore dopo la procedura |
| Tardive | si manifestano oltre le 48 ore             |

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## Complicanze da tracheotomia: classificazione per gravità

|                   |  |
|-------------------|--|
| <b>Lievi</b>      | eventi minori, facili da trattare<br>spesso rilevati casualmente         |
| <b>Intermedie</b> | non causa di importante morbilità<br>se riconosciute e trattate in tempo |
| <b>Gravi</b>      | elevata rilevanza clinica<br>trattamento complesso                       |

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## Complicanze da tracheotomia classificazione per timing

| Immedie                     | Precoci                        | Tardive                   |
|-----------------------------|--------------------------------|---------------------------|
| Difficoltà puntura          | Insufficienza respiratoria ac. | Granulomi tracheali       |
| Emorragia                   | Disfunzione corde vocali       | Cicatrici                 |
| Malposizionamento cannula   | Decannulazione acc.            | Stenosi tracheali         |
| Enfisema sottocutaneo       | Edema laringeo                 | Emorragia tardiva         |
| Perforazione pars membr.    | Granulomi stomici              | Subostruzione cannula     |
| Pneumotorace                | Decesso postoperatorio         | Disfunzioni deglutizione  |
| Pneumomediastino            | Mediastinite                   | Tracheomalacia            |
| Decesso intraoperatorio     | Sepsi                          | Fistola tracheocutanea    |
| Danno strutture adiacenti   | Ostruzione cannula             | Fistola tracheoesofagea   |
| Ipotensione transitoria     | Pneumotorace                   | Fistola tracheoinnominata |
| Ipossia/percapnia trans.    | Pneumomediastino               | Cambiamento tono voce     |
| Switch a tecnica chirurgica | Enfisema sottocutaneo          | Raucedine importante      |
|                             | Emorragia postoperatoria       |                           |
|                             | Perdita aerea                  |                           |

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## Complicanze da tracheotomia classificazione per gravità

| Lievi                         | Intermedie                  | Gravi                      |
|-------------------------------|-----------------------------|----------------------------|
| Difficoltà puntura            | Disfunzione temporanea c.v. | Decesso perioperatorio     |
| Emorragia esterna             | Lesioni anelli tracheali    | Emorragia endotracheale    |
| Cannulazione difficoltosa     | Aspirazione                 | Perforazione pars membr.   |
| Ipotensione transitoria       | Atelettasia                 | Sepsi                      |
| Ipossia/percapnia transitoria | Polmonite                   | Mediastinite               |
| Enfisema sottocutaneo         | Pneumotorace                | Pneumotorace               |
| Perdita aerea                 | Pneumomediastino            | Pneumomediastino           |
| Infezione ferita              |                             | IRA da decannulazione acc. |
| Tracheite                     |                             | Malposizionamento cannula  |
| Ritardata chiusura cutanea    |                             | Ostruzione cannula         |
| Granulomi stomici             |                             | Fistola tracheoesofagea    |
| Edema laringeo                |                             | Fistola tracheoinnominata  |
| Cheloide                      |                             | Stenosi tracheale          |
| Cicatrice non estetica        |                             | Tracheomalacia             |
| Decannulazione acc.           |                             | Disfunzione cronica c.v    |
| Fistola tracheocutanea        |                             | Disturbi deglutizione      |

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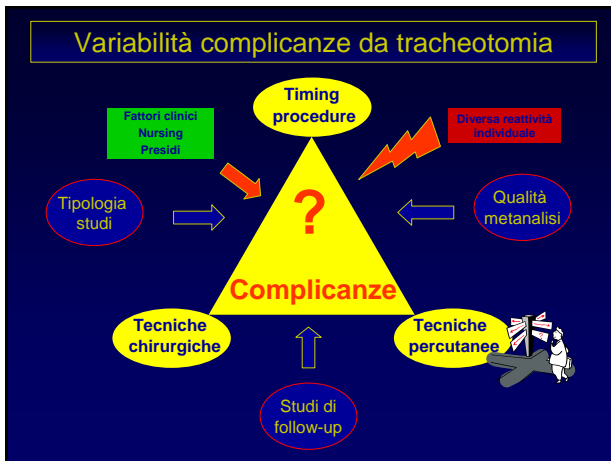
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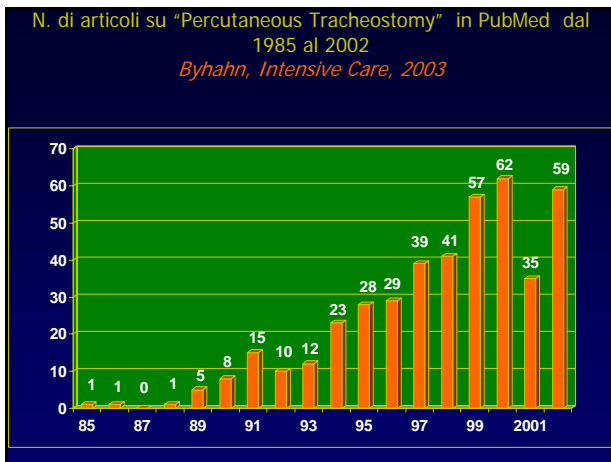
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### Tecniche percutanee (PCT)

| tecnica   | caratteristica  |
|---|---|
| Percutanea-dilatativa con dilatatori multipli (PDT)             | Anterograda, dilatazione in tempi multipli con dilatatori (7) seriali       |
| Percutanea-dilatativa con pinza (GWDF)                          | Anterograda, dilatazione in due tempi con pinza (Howard-Kelly mod)          |
| Tracheotomia translaringea (TLT)                                | Retrograda, dilatazione in tempo unico con la cannula stessa                |
| Percutanea dilatativa con dilatatore unico (CBR)                | Anterograda, dilatazione in un tempo con dilatatore conico                  |
| Percutanea dilatativa con dilatatore unico a vite (Percu-Twist) | Anterograda, dilatazione in un tempo con dilatatore a rotazione controllata |

■ Dilatatori multipli   ■ Dilatatore unico

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# Le complicanze tardive della tracheotomia

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## Complicanze tardive da tracheotomia Lievi

- Granulomi
- Ferita persistente
- Cicatrici
- Fistola tracheocutanea
- Cambiamento tono voce
- Raucedine importante

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## Complicanze tardive da tracheotomia Intermedie

- Emorragia tardiva
- Subostruzione cannula
- Disfunzioni deglutizione

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## Complicanze tardive da tracheotomia Gravi

- Stenosi tracheale
- Tracheomalacia
- Fistola tracheo-esofagea
- Fistola tracheo-innominata

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## Incidenza complicanze tardive

| Complicanze lievi | Tecniche chirurgiche              | Tecniche percutanee               |
|-------------------|-----------------------------------|-----------------------------------|
| Granulomi         | 0.4 % Powell 1998<br>Laryngoscope | 0.4 % Hill 1996<br>J Trauma       |
|                   | 4.7 % Francois 2003<br>Chest      | 0.6 % Powell 1998<br>Laryngoscope |
|                   |                                   | 2,6% Norwood 2000<br>Ann Surg     |

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## Incidenza complicanze tardive

| Complicanze lievi    | Tecniche chirurgiche                             | Tecniche percutanee                   |
|----------------------|--|---------------------------------------|
| Cicatrice inestetica | 0.14 – 0.58 %<br>Dulguerov 1999<br>Crit Care Med | 0.1 % Powell 1998<br>Laryngoscope     |
|                      | 1.2 % Francois 2003<br>Chest                     | 3.8 % Walz 1998<br>Int Care Med       |
|                      |  | 2 % Leonard 1999<br>Chest             |
|                      |  | 0.1 % Dulguerov 1999<br>Crit Care Med |
|                      |  | 5.2 % Massick 2000<br>Laryngoscope    |
|                      |  | 1.6 % Fikkers 2002<br>Anaesthesia     |

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### Incidenza complicanze tardive

| Complicanze lievi      | Tecniche chirurgiche              | Tecniche percutanee   |
|------------------------|-----------------------------------|---|
| Fistola tracheocutanea | 0.2 % Powell 1998<br>Laryngoscope | 3 % Van Heurn 1996<br>Chest<br>0.2 % Powell 1998<br>Laryngoscope<br>0.9 % Walz 1998<br>Int Care Med |

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### Incidenza complicanze tardive

| Complicanze lievi     | Tecniche chirurgiche | Tecniche percutanee   |
|-----------------------|----------------------|---|
| Cambiamento tono voce |                      | 21.3% Van Heurn 1996<br>Chest<br>11.3% Walz 1998<br>Int Care Med<br>48.7% Leonard 1999<br>Chest<br>27 % Norwood 2000<br>Ann Surg<br>10.9% Fikkers 2002<br>Anaesthesia |

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### Incidenza complicanze tardive

| Complicanze intermedie | Tecniche chirurgiche | Tecniche percutanee  |
|------------------------|----------------------|--|
| Raucedine importante   |                      | 0.4 % Hill 1996<br>J Trauma<br>2 % Norwood 2000<br>Ann Surg<br>7.8 % Fikkers 2002<br>Anaesthesia |

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## Incidenza complicanze tardive

| Complicanze intermedie   | Tecniche chirurgiche          | Tecniche percutanee           |
|--------------------------|-------------------------------|-------------------------------|
| Emorragia tardiva        |                               | 1.4 % Hill 1996<br>J Trauma   |
| Subostruzione cannula    | 2.5 % Polderman 2003<br>Chest | 2.3 % Polderman 2003<br>Chest |
| Disfunzioni deglutizione |                               | 0.4 % Hill 1996<br>J Trauma   |

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"Stenosi tra 38 e 83% in 48 su 50 paz (96%)"  
Davidson et al. Lesions of the trachea following tracheostomy and endotracheal intubation.  
Proc R Soc Med, 1971

| Complicanze gravi                         | Tecniche chirurgiche                    | Tecniche percutanee  |
|---|---|--|
| Stenosi tracheali<br><br>Lavori 1969-1984 | 0 % Skaggs 1969<br>Am Surg              |  |
|   | 8 % Mulder 1969<br>J Trauma             |  |
|   | 96 % Davidson 1971<br>Proc R Soc Med    |  |
|   | 33 % Aass 1969<br>Acta Anaes            | "Stenosi > 10% in 9 su 15 paz (65%)"   |
|   | 65 % Stauffer 1981<br>Am J Med          | Stauffer et al. Complications and consequences of endotracheal intubation and tracheostomy. Am J Med, 1981 |
|   | >4 % Schusterman 1983<br>J Ky Med Assoc |  |
|   | 8 % Miller 1984<br>Surg Neurol          |  |

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## Incidenza complicanze tardive

| Complicanze gravi | Tecniche chirurgiche                | Tecniche percutanee                |
|-------------------|-------------------------------------|------------------------------------|
| Stenosi tracheali | 0 % Dayal 1986<br>Laryngoscope      | 0 % Hazard 1988<br>Ann Thorac Surg |
|                   | 32 % Nowak 1987<br>Am J Otolaryngol | 0 % Marelli 1990<br>J Trauma       |
| Lavori 1985-1994  |                                     | 0 % Ciaglia 1992<br>Chest          |
|                   |                                     | 3 % Friedman 1993<br>Chest         |
|                   |                                     | 0 % Winkler 1994<br>Int Care Med   |
|                   |                                     | 5 % McFarlane 1994<br>Anaesthesia  |

"Stenosi in varie sedi in 23 su 72 paz"  
Nowak et al. Airway complications in patients with closed-head injuries  
Am J Otolaryngol 1987

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### Incidenza complicanze tardive

| Complicanze gravi  | Tecniche chirurgiche              | Tecniche percutanee  |
|--|-----------------------------------|--|
| Stenosi tracheali  | 0.5 % Powell 1998<br>Laryngoscope | 0.7 % Marx 1996<br>Chest<br>1.9-26% Van Heurn 1996<br>Chest<br>3.7 % Hill 1996<br>J Trauma<br>2.4-10 % Law 1997<br>Anaesthesia<br>0.94-43.4% Walz 1998<br>Int Care Med<br>1 % Powell 1998<br>Laryngoscope<br>2 % Leonard 1999<br>Chest |
| Lavori   |                                   |  |
| <p>"Percutanea sec Ciaglia. Follow up di 54 paz: stenosi &gt; 10% in 14 (26%); tra 25 e 50% in 2; tra 50 e 75% in 1 (1.9%)"</p> <p>Walt 1999 Percutaneous dilatational tracheostomy - early results and long-term outcome of 326 critically ill patients<br/>Int Care Med, 1998</p> <p>"49 Griggs: follow up su 39; 1 stenosi sottoglottica (2%)"</p> <p>Leonard et al. Late outcome from percutaneous tracheostomy using the Portex Kit<br/>Chest, 1999</p> |                                   |  |

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### Complicanze tardive

| Complicanze gravi   | Tecniche chirurgiche  | Tecniche percutanee  |
|---|---|--|
| Stenosi tracheali   | 1,8% Goldenberg 2000<br>Otol Head Neck Surg<br>12.5 % Polderman 2003<br>Chest<br>1.2 % Francois 2003<br>Chest | 10 % Massick 2000<br>Laryngoscope<br>2-31% Norwood 2000<br>Ann Surg<br>5.2-63 % Dollner 2002<br>Chest<br>1.6 % Fickers 2002<br>Anaesthesia |
| Lavori  |   |  |
| <p>"60 percutanea sec Griggs; follow-up endoscopico in 19 paz; stenosi &gt; 10% in 12 (63%); sintomatica in 1 paziente"</p> <p>Dollner et al. Laryngotracheoscopic findings in long-term follow-up after Griggs tracheostomy<br/>Chest, 2002</p> <p>"100 PDT (Ciaglia); follow up su 58 sopravvissuti; stenosi sintomatica in 6 pazienti (10%)"</p> <p>Massick et al. Quantification of the learning curve for percutaneous dilatational tracheostomy.<br/>Laryngoscope, 2000</p> <p>"422 PDT (Ciaglia); follow up di 48 paz; 1 stenosi &gt; 50%; 15 stenosi &gt; 10%"</p> <p>Norwood et al. Incidence of tracheal stenosis and other late complications after percutaneous tracheostomy.<br/>Ann. Surg. 2000</p> |   |  |

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### Incidenza complicanze tardive

| Complicanze gravi         | Tecniche chirurgiche  | Tecniche percutanee  |
|---------------------------|---|--|
| Fistola tracheoinnominata | 0.4-4.5 % Powell 1998<br>Laryngoscope<br>0.4 % Goldenberg 2000<br>Otol Head Neck Surg | 0.2 % Powell 1998<br>Laryngoscope  |
| Fistola tracheoesofagea   | 0.2 % Powell 1998<br>Laryngoscope<br>0.01-1% Goldenberg 2000<br>Otol Head Neck Surg   | 0.3 % Hill 1996<br>J Trauma<br>1.8 % Donaldson 2000<br>Laryngoscope<br>0.17 % Louis 2003<br>Ann Fr Anesth Rean |

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## Complicanze postoperatorie delle tracheotomie percutanee

|             | PDT-PcT | PDT-PcT<br>Controllo endoscopico |
|-------------|---------|----------------------------------|
| n. pazienti | 1123    | 373                              |
| gravi       | 2.94%   | 1.34%                            |
| intermedie  | 0,89%   | 0,27%                            |
| minori      | 3,9%    | 3,7%                             |
| totale      | 7.75%   | 5.36%                            |

Dulguerov et al. Crit Care Med 1999

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## La prevenzione delle complicanze stenotiche

- timing della tracheostomia
- monitoraggio pressione cuffia
- ancoraggio della cannula
- limitare le trazioni del circuito respiratorio
- accurata medicazione del tracheostoma
- umidificazione dei gas inspiratori
- corretta manovra di aspirazione
- igiene del cavo orale
- evitare ristagno di secrezioni sopra la cuffia

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## Controllo e follow-up del paziente tracheostomizzato

- pianificare i tempi per il cambio-cannula
- programmare es. endoscopico al cambio-cannula
- valutare la ventilazione translaringea appena possibile
- esame endoscopico alla dimissione da ICU
- controllo clinico-radiologico-endoscopico a 3-6 mesi dalla decannulazione
- questionario per la valutazione degli esiti

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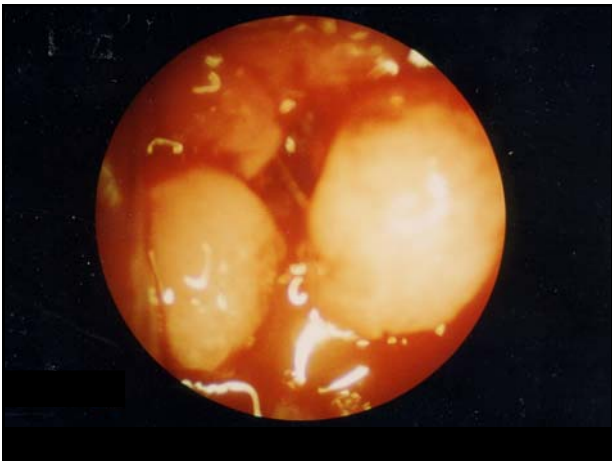
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## STENOSI LARINGOTRACHEALI

### Terapia

- Chirugica: resezione-anastomosi plastica laringea
- Conservativa: calibrazione con stent laser  
dilatazione ?  
infiltrazione

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## STENOSI LARINGOTRACHEALI

### Terapia chirurgica controindicazioni

#### 1. Locali

- Estensione (> 50%)
- Infiammazione – infezione

#### 2. Generali

- Condizioni cliniche

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## STENOSI POST INTUBAZIONE/TRACHEOTOMIA

CASISTICA DAL 1982 AL 2003

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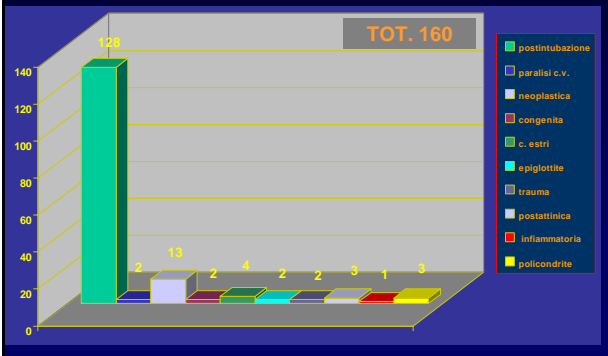
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## STENOSI LARINGO-TRACHEALI CAUSE




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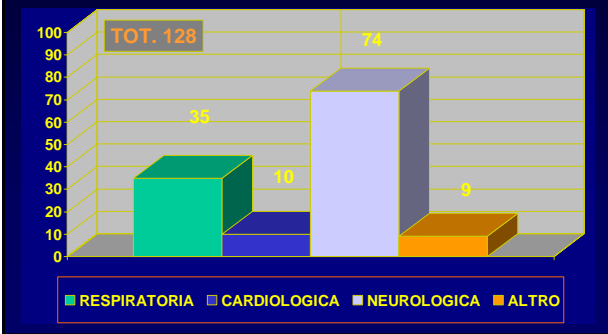
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## STENOSI POSTINTUBAZIONE PATOLOGIE IN RIANIMAZIONE




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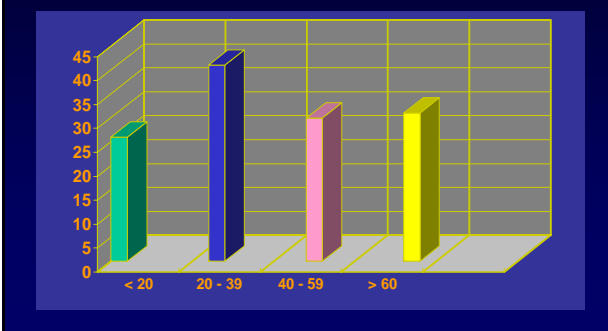
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## STENOSI POST-INTUBAZIONE età




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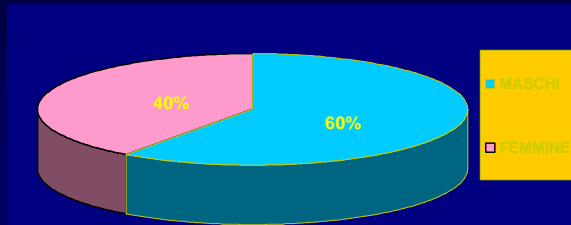
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## STENOSI POSTINTUBAZIONE

SESSO




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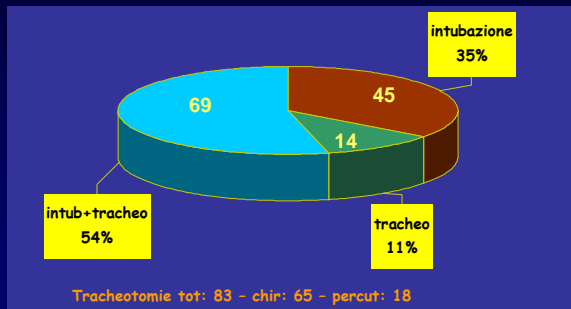
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## STENOSI POST-INTUBAZIONE

eziologia




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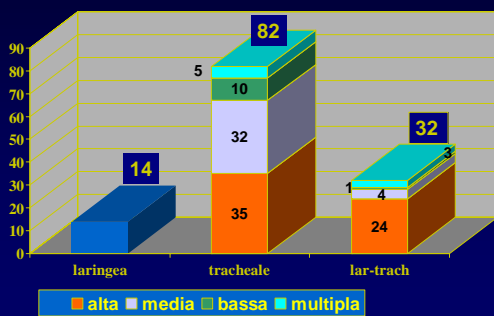
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## STENOSI POST-INTUBAZIONE

sede




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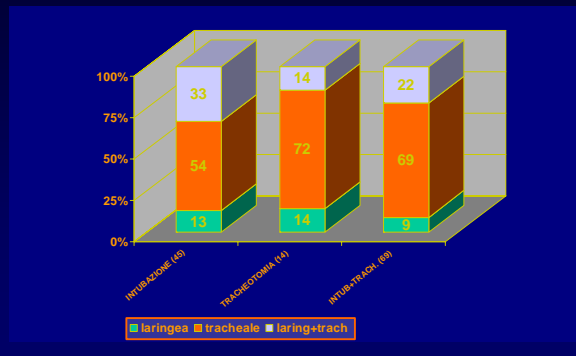
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## STENOSI LARINGO-TRACHEALI

sede secondo eziologia




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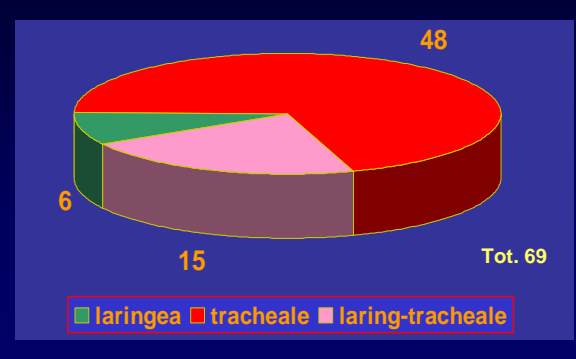
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## STENOSI LARINGO-TRACHEALI

Sede secondo eziologia: intub + tracheo




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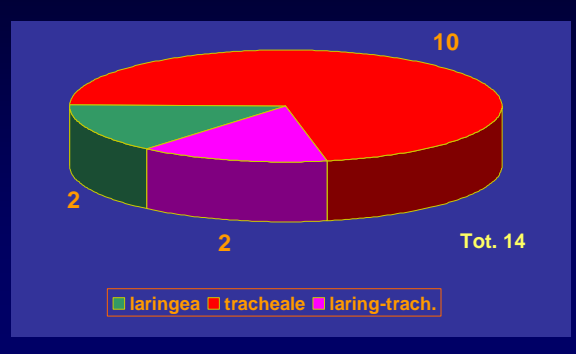
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## STENOSI LARINGO-TRACHEALI

sede secondo eziologia: tracheotomia




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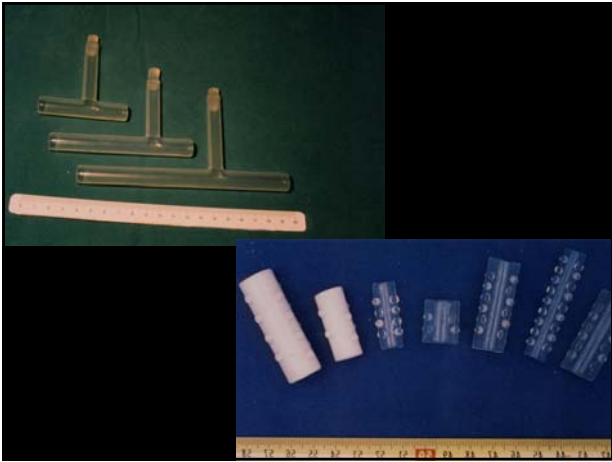
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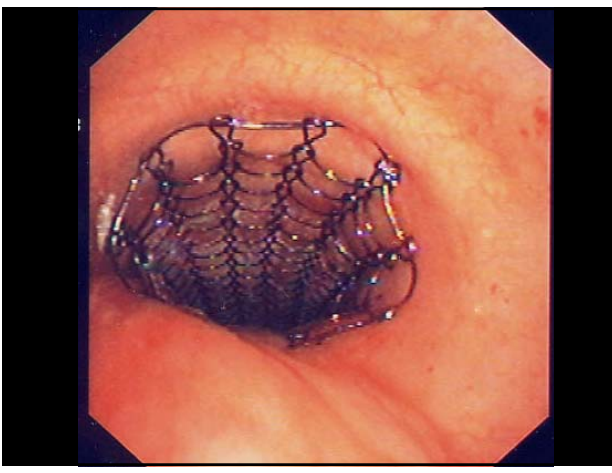
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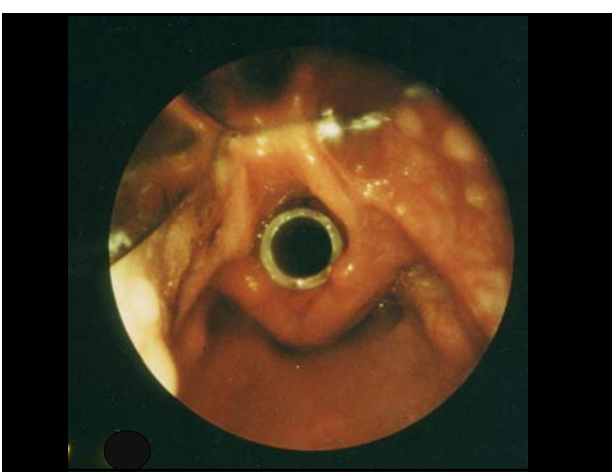
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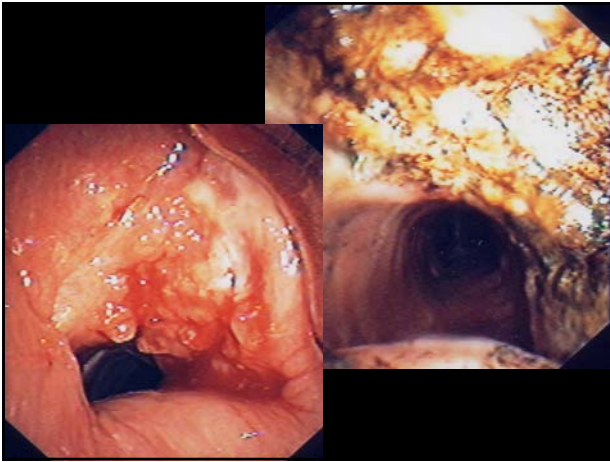
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### Risultati: 128 pazienti

| trattamento      | n.                                      | esito      |          |   |
|------------------|---|------------|----------|---|
|                  |   | guarigione | ricidiva |   |
| Chirurgico       | 7                                       | 6          | 1        | 1 stent a permanenza  |
| Conservativo     | 121                                     | 75 (69%)   | 34       | 12 pazienti in corso di trattamento   |
| •Laser           | 3                                       | 3          | -        |   |
| •Stent tracheale | 118<br><small>12 in trattamento</small> | 72         | 34 →     | 19 stent a permanenza<br>15 intervento chirurgico<br>(1 stent a permanenza) |

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Grazie per  
l'attenzione



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