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Early oral feeding

- Advantages of early oral feeding
- Pharyngocutaneous fistula (PCF) formation and feeding after total laryngectomy
- Table of PCF rates in comparative studies of patients receiving early vs. late oral feeding

Preface

This document contains a bibliography and summaries of selected publications relating to early oral feeding after total laryngectomy. The document is part of a growing, and regularly updated collection of documents, the Atos Medical Clinical Evidence Series, covering various clinical topics related to Atos Medical's areas of expertise. The topics are chosen based on questions, suggestions and requests that we receive from our customers.

Available topics are:

- Primary versus Secondary TE puncture
- Primary versus Delayed Voice Prosthesis Fitting
- Laryngectomy and Reflux
- Compliant HME use

If you are interested in any of the topics listed above, or if you have a suggestion for additional topics, please contact your local Atos Medical representative. Due to International Copyright law, we cannot provide full-text publications of the references. If a publication is available online via 'Open Access' the link is provided in the document.

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Advantages of early oral feeding

Evidence that late oral feeding would reduce the incidence of PCF is weak, whereas there are several arguments supporting early oral feeding as a preferable and beneficial approach[3]. Advantages include reduced hospitalization[2,4-8], psychological benefit to the patient[1,3-6], reduced need for specialized nursing care[5] and reduced financial cost[2-7].

It has been proven that the stress and local trauma created by the nasogastric feeding tube (NG tube) on the fresh pharyngeal suture line actually achieves the opposite from what is intended with respect to PCF[1,3,6]. Sparing the patient the need for nutrition via NG tubes contributes to a more comfortable post-operative recovery[1,3-8], as well as supporting an earlier restoration of the normal swallowing mechanism[1,6]. Early oral feeding may also be beneficial from a psychological perspective. Patients can be encouraged in that they seem to be returning to normalcy (more) quickly and allowing voice restoration to be commenced early[3,5].

Furthermore, eliminating the use of the special tube-feeding material and reducing the length of hospital stay, results in hospitalization cost savings without increasing morbidity[2-7].

The publications listed below all concern publications regarding the advantages of post-operative early feeding that are referenced above. Clicking the link while holding the Ctrl key will take you directly to the summary you are interested in.

[1]Süslü N, Sefik Hosal A. Early oral feeding after total laryngectomy: Outcome of 602 patients in one cancer center. Auris Nasus Larynx. 2016 Oct;43(5):546-50.

[2]Serbanescu Kele CM, Halmos GB, Wedman J, van der Laan BF, Plaat BE. Early feeding after total laryngectomy results in shorter hospital stay without increased risk of complications: a retrospective case-control study. Clin Otolaryngol. 2015 Dec;40(6):587-92.

[3]Timmermans AJ, Lansaat L, Kroon GV, Hamming-Vrieze O, Hilgers FJ, van den Brekel MW. Early oral intake after total laryngectomy does not increase pharyngocutaneous fistulization. Eur Arch Otorhinolaryngol. 2014 Feb;271(2):353-8.

[4]Prasad KC, Sreedharan S, Dannana NK, Prasad SC, Chandra S. Early oral feeds in laryngectomized patients. Ann Otol Rhinol Laryngol. 2006 Jun;115(6):433-8.

[5]Aswani J, Thandar M, Otiti J, Fagan J. Early oral feeding following total laryngectomy. J Laryngol Otol. 2009 Mar;123(3):333-8.

[6]Saydam L, Kalcioglu T, Kizilay A. Early oral feeding following total laryngectomy. Am J Otolaryngol. 2002 Sep-Oct;23(5):277-81.

[7]Medina JE, Khafif A. Early oral feeding following total laryngectomy. Laryngoscope. 2001 Mar;111(3):368-72.

[8]Akyol MU, Ozdem C, Celikkanat S. Ear Nose Throat J. Early oral feeding after total laryngectomy. 1995 Jan;74(1):28-30.

Süslü et al. 2016

Title

Early oral feeding after total laryngectomy: Outcome of 602 patients in one cancer center.

Authors

Süslü N[1], Şefik Hoşal A[2].

Affiliations

[1]Department of Otorhinolaryngology - Head and Neck Surgery, Hacettepe University Faculty of Medicine, Turkey. Electronic address: nildasuslu@yahoo.com
[2]Department of Otorhinolaryngology - Head and Neck Surgery, Hacettepe University Faculty of Medicine, Turkey.

Journal and year of publication

Auris Nasus Larynx. 2016 Oct;43(5):546-50.

Type of publication

Retrospective cohort study

Objective

Pharyngocutaneous fistula (PCF) is the most frequent complication after total laryngectomy. However, delayed oral feeding and inserting a nasogastric tube has been considered as a safe practice among head and neck surgeons, and there is no general agreement on the initiation of the oral intake. The aim of the study is to determine the incidence of PCF after primary total laryngectomy in a large homogenous case series and to evaluate whether fistula and early oral feeding are related.

Subjects and Methods

Patients who underwent total laryngectomy/laryngopharyngectomy with primary closure of pharynx between 1990 and 2014 were reviewed. Patients who had a history of previous radiotherapy, chemotherapy or chemoradiotherapy, and patients who underwent more complex reconstruction techniques (e.g. pedicled or free flaps) for closure were excluded. In total, 602 patients underwent total laryngectomy (n=580) or total laryngectomy plus partial pharyngectomy (n=22).

Results

The overall PCF rate was 12%. In 582 of the 602 patients (99.8%), a nasogastric tube was not inserted. In 95.7% of the patients (576/602), oral feeding was started within 3 days of surgery. Among the patients who developed PCF (72/602), PCF rate was not significantly higher in early oral fed patients (69/582, 11.8%) than the patients with nasogastric tube insertion (3/20, 15%) (p=0.722).

Conclusion

We believe in the advantages of early oral feeding. Number of patients in the present study is one of the largest series in the literature. The low pharyngocutaneous fistula rate (12%) among

those patients reveals the safety and efficacy of this method. Furthermore, early oral feeding may assist earlier restoration of normal swallowing function. The nasogastric (N/G) tube has also been demonstrated to cause local trauma and significantly increases stress to the pharyngeal suture line, which may contribute to fistula formation. It is clear that carrying a nasogastric tube for one or two weeks is uncomfortable for patients. Since patients are in a psychological discomfort because of their cancer and losing their larynx, placement of a nasogastric tube creates an additional stress on their well-being. However, further studies for the role of early oral feeding particularly in salvage laryngectomies in organ preservation era are needed.

Serbanescu-Kele et al. 2015

Title

Early feeding after total laryngectomy results in shorter hospital stay without increased risk of complications: a retrospective case-control study.

Authors

Serbanescu-Kele CM[1], Halmos GB[1], Wedman J[1], van der Laan BF[1], Plaat BE[1]

Affiliations

[1]Department of Otorhinolaryngology, Head and Neck Surgery, University of Groningen, University Medical Center Groningen, Groningen, The Netherlands.

Journal and year of publication

Clin Otolaryngol. 2015 Dec;40(6):587-92.

Type of publication

Retrospective case-control study

Objective

To evaluate the effects of a reduced nil per os (NPO) period after total laryngectomy (TLE) on general and wound-related post-operative complications, swallowing function and duration of hospital stay.

Subjects and Methods

In a retrospective case-control study in 71 patients after TLE with primary closure (i e. without reconstruction with tissue transfer), complications and hospitalisation in 36 patients who started oral feeding on days 3-5 (early feeding) were compared with 30 patients who started oral feeding on days 7-10 (late feeding).

Results

There were no significant differences between the early- and late-feeding groups in the occurrence of pharyngocutaneous fistulae, neopharyngeal stenosis or wound complications in general. Swallowing function was comparable for both groups. Mean overall hospitalisation was 2 days shorter in the early-feeding group (mean: 17.4 days) as compared to the late-feeding group (mean: 19.4 days) ($P < 0.05$).

Conclusion

Early feeding at day 3 is safe for the general population of both primary and salvage TLE patients, as it does not cause an increased incidence of pharyngocutaneous fistulae or other complications. This protocol is safe, shortens hospital stay and has no adverse effect on long-term swallowing function. Finally, as in modern society healthcare costs are an item of concern, this study provides an example how costs can be decreased by challenging those protocols that are partially based on tradition.

Timmermans et al. 2014

Title

Early oral intake after total laryngectomy does not increase pharyngocutaneous fistulization.

Authors

Timmermans AJ[1], Lansaat L, Kroon GV, Hamming-Vrieze O, Hilgers FJ, van den Brekel MW.

Affiliations

[1]Department of Head and Neck Oncology and Surgery, Netherlands Cancer Institute-Antoni van Leeuwenhoek, Amsterdam, The Netherlands.

Journal and year of publication

Eur Arch Otorhinolaryngol. 2014 Feb;271(2):353-8.

Type of publication

Prospective randomized controlled study

Objective

Timing of oral intake after total laryngectomy (TLE) is mostly delayed until postoperative day 10-12, under the assumption that this limits the incidence of pharyngocutaneous fistulization (PCF). However, evidence that late oral intake (LOI) reduces the incidence of PCF is quite weak, whereas there are several arguments supporting EOI as advantageous and could reduce costs, be psychological beneficial

Subjects and Methods

Comparison of PCF incidence in traditional 'late' oral intake protocol (start at postoperative day 10-12; LOI) and in early oral intake protocol (start at postoperative day 2-4; EOI). Retrospective cohort study comparing two different oral intake protocols in 247 consecutive patients laryngectomized between early 2000 until mid 2006 (LOI; N = 140), and mid 2006 until mid 2012 (EOI; N = 107).

Results

Both groups were comparable in terms of sex, age, origin of tumor, and TLE indication, except for the American Society of Anesthesiologists score (ASA), which was slightly more favorable in the LOI group ($p = 0.047$). Compliance with the oral intake protocols during both periods was good: the median day of starting oral intake was day 11 (range 6-103) in the LOI group vs. day 3 (range 2-84) in the EOI group ($p = 0.001$). The incidence of PCF was not significantly different between the two groups (25% for LOI and 32% for EOI; Fisher's exact: $p = 0.255$). In addition, no association was observed between the timing of oral intake and PCF (HR = 0.995; CI 0.98-1.01; $p=0.364$).

Conclusion

This study suggests that early oral intake is safe and does not increase pharyngocutaneous fistulization. With LOI the movements of the NGT are stressing the pharyngeal suture line longer, and therefore the NGT achieves the opposite from what is intended with respect to PCF. From a psychological perspective, it could be valuable to start oral intake early in the postoperative period, because this is encouraging for patients in that they seem to be returning to normalcy

(more) quickly. Patients start with voice and speech rehabilitation not sooner than day 10–12, and are only discharged if speech proficiency is satisfactory. In future this may change, however, since possibilities for providing the necessary (outpatient) rehabilitation support have recently increased.

Prasad et al. 2006

Title

Early oral feeds in laryngectomized patients.

Authors

Prasad KC[1], Sreedharan S, Dannana NK, Prasad SC, Chandra S.

Affiliations

[1]Department of Otolaryngology-Head and Neck Surgery, Kasturba Medical College and Affiliated Hospitals, Mangalore, India

Journal and year of publication

Ann Otol Rhinol Laryngol. 2006 Jun;115(6):433-8.

Type of publication

Prospective randomized controlled study

Objective

It is a common practice to start oral feeding after 7 to 10 days in patients who have undergone laryngeal surgeries. It was our observation that when oral feeds were initiated earlier than this period, there was no increase in the incidence of pharyngocutaneous fistulas. This prospective study is about our experience in initiating early oral feeds in the postoperative period (on the 2nd day) in laryngectomized patients.

Subjects and Methods

Seventy-eight patients underwent laryngectomy with or without partial pharyngectomy over a period of 38 months between October 2001 and December 2004. The oral feeds were initiated on the 2nd postoperative day in 40 patients. Thirty-eight patients served as controls in whom feeds were initiated after the 10th postoperative day.

Results

Only 1 patient in the study group and 2 patients in the control group developed pharyngocutaneous fistulas. Most patients in the control group wished to avoid nasogastric intubation in the recovery period because of discomfort, gastric symptoms, and the need to taste food.

Conclusion

With this study we can assume that in a select group of patients, it is possible to initiate oral feeding much earlier in the postoperative period than was formerly thought. The presence of a NG tube is irritating to the nose, pharynx and esophagus in most patients. Hence, early oral feeding would undoubtedly have psychological benefits for the patient and thereby also decrease the hospital stay.

Aswani et al. 2009

Title

Early oral feeding following total laryngectomy.

Authors

Aswani J[1], Thandar M, Otiti J, Fagan J.

Affiliations

[1]Division of Otolaryngology, Faculty of Health Sciences, University of Cape Town, South Africa

Journal and year of publication

J Laryngol Otol. 2009 Mar;123(3):333-8.

Type of publication

Prospective

Objective

Aim to determine whether, in a developing world context, early oral feeding after laryngectomy is safe, cost-effective and appropriate.

Subjects and Methods

Forty patients underwent total laryngectomy for advanced carcinoma of the larynx with or without hypopharyngeal involvement, not requiring tongue base resection or myocutaneous flaps, and were commenced on oral feeding on the second post-operative day. Thirty-nine laryngectomy patients previously managed in the same unit who had received conventional, delayed oral feeding served as controls.

Results

Pharyngocutaneous fistulae developed in 20 per cent of the early feeding patients, compared with 15.4 per cent of the delayed oral feeding controls ($p = 0.592$). For patients who did not develop fistulae, hospitalisation was shorter in the early oral feeding group ($p = 0.007$).

Conclusion

For lower socioeconomic group patients within developing nation health systems, early commencement of postlaryngectomy oral feeding may not reduce the overall length of hospitalisation, but it has advantages in terms of psychological benefit to the patient, reduced need for specialised nursing care and reduced financial cost (by avoiding special enteral tube feeds). The results of the present study concur with those of previous reports, i.e. that early oral feeding is safe in patients who have undergoing laryngectomy, both with and without neck dissection, and that it can be recommended in both developing and developed world settings.

Saydam et al. 2002

Title

Early oral feeding following total laryngectomy.

Authors

Saydam L[1], Kalcioglu T, Kizilay A.

Affiliations

[1]Department of Otolaryngology, Bayindir Medical Center, Ankara; and the Department of Otolaryngology, Inonu University Medical School, Malatya, Turkey

Journal and year of publication

Am J Otolaryngol. 2002 Sep-Oct;23(5):277-81.

Type of publication

Retrospective review

Objective

Pharyngocutaneous fistula is one of the most common nonfatal laryngectomy complications (7.6% to 65% of all total patients). Preoperative radiotherapy, advanced tumor stage, poor preoperative medical status, and concomitant pharyngectomy are usually accepted causative factors in fistula formation. Delay of oral feeding is a common practice used by head and neck surgeons to prevent the development of pharyngocutaneous fistula. In this article we analyze our experience with special emphasis given to the early start of postoperative feeding.

Subjects and Methods

The postoperative records of 48 patients who had undergone total laryngectomy or total laryngopharyngectomy were reviewed. All patients were orally fed with water and clear liquids on the first postoperative day. The patients were closely observed at every feeding attempt, and if any sign of fistula was noted, a nasogastric tube was inserted. Preoperative radiotherapy, stage of disease, tumor differentiation, and pharyngectomy with total laryngectomy were statistically analyzed as potential risk factors contributing to fistula formation. The Fisher exact test was used to analyze the data.

Results

The overall pharyngocutaneous fistula rate was 12.5% in our series. The only statistically significant factor that increased the rate of fistula formation was resection of pharyngeal mucosa as an extension of total laryngectomy. Other parameters failed to show any statistical significance in development of this complication.

Conclusion

Evaluation of fistula incidence in our series indicates that initiating oral feeding on the first postoperative day does not contribute to fistula formation. Aspect of early oral feeding is higher patient comfort owing to the elimination of psychologic stress and possible complications caused by the nasogastric tube's mechanical irritation. Patients feel more comfortable and confident and may have a quicker restoration of the normal swallowing mechanism by

providing the different steps of deglutination. The relatively shortened hospital stay and elimination of the psychologic and traumatic side effects of tube feeding are benefits of this approach that should be studied in further prospective quality-of-life studies.

Medina et al. 2001

Title

Early oral feeding following total laryngectomy.

Authors

Medina JE[1], Khafif A.

Affiliations

[1]Head and Neck Service, Department of Otolaryngology, The University of Oklahoma Health and Sciences Center, 920 Stanton Young Boulevard, Oklahoma City, OK 26901, USA

Journal and year of publication

Laryngoscope. 2001 Mar;111(3):368-72.

Type of publication

Sequential study and prospective analysis

Objective

The time to begin oral feeding after total laryngectomy remains a subject of debate among head and neck surgeons. The prevailing assumption is that early initiation of oral feeding may cause pharyngocutaneous fistula; thus, the common practice of initiating oral feeding after a period of 7 to 10 days. The objective of the study was to demonstrate the feasibility and safety of oral feeding 48 hours after total laryngectomy.

Subjects and Methods

Patients undergoing total laryngectomy without partial pharyngectomy or radiation treatment (except irradiation through small ports for a T1 or T2 glottic carcinoma) were included. In the first, sequential part of the study (part I), a group of 18 patients who were fed 7 to 10 days after total laryngectomy (control group) was compared with a group of 20 patients who received oral feeding within 48 hours. To confirm the results of part I, a prospective analysis of this practice was conducted (part II) in which 35 additional patients who met the above criteria were fed within 48 hours after surgery.

Results

In part I, pharyngocutaneous fistula occurred in one patient (5%) in the early feeding group and in two patients (11%) in the control group. In part II, pharyngocutaneous fistula occurred in one patient (2.8%). Overall, fistula occurred in two patients in the combined early feeding group (3.6%). This rate of pharyngocutaneous fistula compares favorably with the fistula rate in the control group of 18 patients. Pharyngeal stricture that required dilation occurred in three of our patients in the study group and two in the control group (5.5% vs. 11%, respectively). The length of hospital stay was significantly shortened from 12 to 7 days.

Conclusion

Our results indicate that in this patient population initiation of oral feeding 48 hours after total laryngectomy is a safe clinical practice. Early resumption of oral feeding spares patients the inconvenience of a nasogastric feeding tube and allows them to leave the hospital sooner. The

hospital stay was longer than 48 to 72 hours (time until resumption of oral feeding) mainly because of the need for teaching patients tracheostomy care and voice rehabilitation, and we think that, although this period could be shortened with appropriate preoperative and postoperative training, it remains a factor limiting early discharge of these patients. Our observations suggest that early oral feeding after total laryngectomy may be a "cost-effective" practice because it results in hospitalization cost savings without increasing morbidity.

Akyol et al. 1995

Title

Early oral feeding after total laryngectomy.

Authors

Akyol MU[1], Ozdem C, Celikkanat S.

Affiliations

[1]Ankara Numune Hospital, 2nd. ENT Clinic, Turkey

Journal and year of publication

Ear Nose Throat J. 1995 Jan;74(1):28-30.

Type of publication

Retrospective review

Objective

The purpose of this study is to indicate the advantages of early oral feeding after laryngectomy.

Subjects and Methods

110 patients were orally fed on the first/second postoperative day without using a nasogastric (NG) tube.

Results

Pharyngo-cutaneous fistula was observed in 23 patients (21%) only nine of which (8%) needed surgical intervention to close the fistula. For the remaining 14 patients, leaking from the pharynx underneath the skin flaps was successfully stopped by keeping the flaps in place with additional external pressure and surgical intervention was not required.

Conclusion

Carrying a NG tube for approximately two weeks is uncomfortable and a major stress factor for the patient besides having its own complications. Early postoperative oral feeding of laryngectomized patients does not increase the fistula rate but decreases postoperative hospitalization time and eliminates the disadvantages of the NG tube.

Pharyngocutaneous fistula formation and feeding after total laryngectomy

Pharyngocutaneous fistulization (PCF) is considered to be the most common postoperative adverse event in laryngectomized patients. The incidence of PCF varies from 3% to 65% in literature[1-3,5,6]. PCF is associated with prolonged hospitalization, increased morbidity and cost of care, delays in adjuvant therapy and oral feeding[1-4,6,7].

Factors related to post-operative PCF in literature includes preoperative (chemo)radiotherapy[3], advanced primary tumor (T3-T4)[3, 7], hypopharynx malignancy[3], wound class[1], pre-operative transfusion[1], free-flap reconstruction compared to primary closure[1,3], low preoperative albumin level (less than 40 g/L)[3], longer duration of surgery[3], more-extensive pharyngeal resection[3] and invasive carcinoma[5]

There is an historical assumption that the act of swallowing and the exposure of saliva and other fluids to the suture line might lead to PCF[7,8]. In an attempt to prevent the development of PCF, head and neck surgeons have delay oral feeding in?? laryngectomized patients to the 7-10th postoperative day[2-5,8]. However, the evidence that late oral feeding would reduce the incidence of PCF is weak[2,4,5,8].

Feeding through a nasogastric tube has been provided as the usual practice in the early post-operative period[8]. However, patients usually start to swallow their own saliva in the first 24 to 48 hours postoperatively[7]. The saliva is more harmful to the tissues than other liquids or foods because of its pH and the presence of amylase[2]. Introducing early intake of water or food would dilute saliva, thus reducing its action at the suture line, which might in fact decrease the risk of salivary fistula[2].

Contrary to historical opinion, several studies in the literature have not been able to find any statistically significant difference in the incidence of PCF between early and late feeding after total laryngectomy. These studies suggest that it is possible and safe to initiate oral feeding much earlier in the postoperative period than previously thought[1-8].

The publications listed below concern the publications regarding the incidence and predictive factors of pharyngocutaneous fistula formation and feeding after total laryngectomy referenced above. Clicking the link while holding the Ctrl key will take you directly to the summary you are interested in.

[1]Lebo NL, Caulley L, Alsaffar H, Corsten MJ, Johnson-Obaseki S. Peri-operative factors predisposing to pharyngocutaneous fistula after total laryngectomy: analysis of a large multi-institutional patient cohort. J Otolaryngol Head Neck Surg. 2017 Aug 23;46(1):54.

[2]Aires FT, Dedivitis RA, Petrarolha SM, Bernardo WM, Cernea CR, Brandão LG. Early oral feeding after total laryngectomy: A systematic review. Head Neck. 2015 Oct;37(10):1532-5.

[3]Timmermans AJ, Lansaat L, Theunissen EA, Hamming-Vrieze O, Hilgers FJ, van den Brekel MW. Predictive factors for pharyngocutaneous fistulization after total laryngectomy. Ann Otol Rhinol Laryngol. 2014 Mar;123(3):153-61

[4]Kishikova L, Fleming JC. Oral feeding following laryngectomy: early or delayed? Int J Surg. 2014 Nov;12(11):1137-40.

[5]Sousa AA, Porcaro-Salles JM, Soares JM, de Moraes GM, Silva GS, Sepulcri RA, Savassi-Rocha PR. Does early oral feeding increase the likelihood of salivary fistula after total laryngectomy? J Laryngol Otol. 2014 Apr 15:1-7.

[6]Aires FT, Dedivitis RA, Castro MA, Ribeiro DA, Cernea CR, Brandão LG. [Pharyngocutaneous fistula following total laryngectomy]. Braz J Otorhinolaryngol. 2012 Dec;78(6):94-8.

[7]Estaquio M, Medina JE, Krempl GA, Hales N. Early oral feeding after salvage laryngectomy. Head Neck. 2009 Oct;31(10):1341-5.

[8]Seven H, Calis AB, Turgut S. A randomized controlled trial of early oral feeding in laryngectomized patients. Laryngoscope. 2003 Jun;113(6):1076-9.

Lebo et al. 2017

Title

Peri-operative factors predisposing to pharyngocutaneous fistula after total laryngectomy: analysis of a large multi-institutional patient cohort.

Authors

Lebo NL[1], Caulley L[2], Alsaffar H[2], Corsten MJ[3], Johnson-Obaseki S[2].

Affiliations

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[2]Department of Otolaryngology - Head and Neck Surgery, University of Ottawa, S3, 501 Smyth Road, Ottawa, ON, K1H 8L6, Canada
[3]Department of Otolaryngology, Aurora Health Care, Aurora St. Luke's Hospital, Milwaukee, WI, USA

Journal and year of publication

J Otolaryngol Head Neck Surg. 2017 Aug 23;46(1):54

Type of publication

Retrospective cohort study

Objective

Pharyngocutaneous fistula (PCF) is a problematic complication following total laryngectomy. Disagreement remains regarding predisposing factors. This study examines perioperative factors predicting PCF following total laryngectomy using a large multicenter data registry.

Subjects and Methods

Retrospective cohort analysis was performed using patients undergoing total laryngectomy in the ACS-NSQIP database for 2006-2014. Sub-analysis was performed based on reconstruction type. Multivariate analysis of 971 patients was performed. Outcome of interest was PCF development within 30 days.

Results

Three variables showed statistical significance in predicting PCF: wound classification of 3 and 4 vs. 1-2 (OR 6.42 $P < 0.0004$ and OR 8.87, $P < 0.0042$), pre-operative transfusion of > 4 units of packed red blood cells (OR 6.28, $P = 0.043$), and free flap versus no flap reconstruction (OR 2.81, $P = 0.008$).

Conclusion

This is the largest multi-center study evaluating the risk factors for PCF using prospectively gathered data to date. Identified statistically significant risk factors of PCF for all-comers were: wound class, pre-operative transfusion, and free-flap reconstruction compared to primary closure. These factors should prompt surgeons to consider close monitoring in the post-operative setting for PCF, given the higher risk in these selected patients.

Aires et al. 2015

Title

Early oral feeding after total laryngectomy: A systematic review.

Authors

Aires FT[1], Dedivitis RA[2], Petrarolha SM[3], Bernardo WM[4], Cernea CR[5], Brandão LG[5].

Affiliations

[1]Department of Surgery, Hospital Ana Costa, Santos, Brazil
[2]Department of Head and Neck Surgery, Hospital das Clínicas, University of São Paulo School of Medicine, São Paulo, Brazil
[3]Department of Head and Neck Surgery, Hospital Ana Costa, Santos, Brazil
[4]Department of Evidence Based Medicine, Medical Sciences School of Santos - UNILUS, Santos, Brazil
[5]Department of Head and Neck Surgery, University of São Paulo School of Medicine, São Paulo, Brazil

Journal and year of publication

Head Neck. 2015 Oct;37(10):1532-5.

Type of publication

Systematic review

Objective

Early oral feeding for patients who underwent total laryngectomy is still controversial. The purpose of this study was to evaluate the safety of initiating early oral feeding after total laryngectomy regarding pharyngocutaneous fistula. The survey included research in MEDLINE, EMBASE, and LILACS.

Subjects and Methods

The intervention analyzed was early oral feeding (<5 days), whereas the control group received late oral feeding (>7 days) after total laryngectomy.

Results

From 304 studies, 4 randomized clinical trials with 180 patients were selected. In the early oral feeding group, the incidence was 6.7%, whereas in the late oral feeding group it was 10%, with no statistically significant difference (IC95% -0.11 to 0.05; p = .42; I(2) = 0%). Four cohort studies with 490 patients were also selected. In the early oral feeding group, the incidence was 12.2%, whereas in the other group, it was 10.1%, with no statistically significant difference (IC95% -0.05 to 0.08; p = .67; I2 = 0%).

Conclusion

The saliva is more harmful to the tissues than other liquids or foods because of its pH and the presence of amylase. Introducing early intake of water or food would dilute saliva, thus reducing its action at the suture line, which could decrease the risk of salivary fistula. Furthermore, it would permit early discharge from the hospital, reducing psychological stress, complications caused by the use of alternative feeding, and hospital costs. The evidence synthesis allows for the

conclusion that there is no increase in pharyngocutaneous fistula rates in patients who receive early oral feeding (<5 days) after total laryngectomy when compared with patients who receive late oral feeding (>7 days). Other benefits offered by early oral feeding should be considered for recommendation.

Timmermans et al. 2014

Title

Predictive factors for pharyngocutaneous fistulization after total laryngectomy.

Authors

Timmermans AJ[1], Lansaat L, Theunissen EA, Hamming-Vrieze O, Hilgers FJ, van den Brekel MW.

Affiliations

[1]Department of Head and Neck Oncology and Surgery, University of Amsterdam, Amsterdam, the Netherlands

Journal and year of publication

J Otolaryngol Head Neck Surg. 2017 Aug 23;46(1):54

Type of publication

Retrospective cohort study

Objective

Postoperative complications, especially pharyngocutaneous fistulization (PCF), are more frequent after total laryngectomy (TL) performed for salvage after (chemo)radiotherapy than after primary TL. The aim of this study was to identify the incidence of PCF, predictive factors for PCF, and the relationship of PCF to survival.

Subjects and Methods

We performed a retrospective chart review of 217 consecutive patients treated with TL between 2000 and 2010. Univariate and multivariable analysis with logistic regression was used to identify factors associated with PCF. We used a Kaplan-Meier survival analysis.

Results

The overall incidence of PCF was 26.3% (57 of 217 cases). The incidence of PCF after primary TL was 17.1% (12 of 70), that after salvage TL was 25.5% (25 of 98), that after TLE for a second primary was 37.5% (9 of 24), and that after TL for a dysfunctional larynx was 44.0% (11 of 25). The predictive factors for PCF were hypopharynx cancer (odds ratio [OR], 3.67; 95% confidence interval [CI], 1.74 to 7.71; P = .001), an albumin level of less than 40 g/L (OR, 2.20; 95% CI, 1.12 to 4.33; P = .022), previous chemoradiotherapy (OR, 3.38; 95% CI, 1.34 to 8.52; P = .010), more-extended pharyngeal resection (P = .001), and pharynx reconstruction (P = .002). The median duration of survival was 30 months (95% CI, 17.5 to 42.5); the 2-year overall survival rate was 54%. The median duration of survival of patients with PCF was 23 months (95% CI, 9.4 to 36.6), and that of those without PCF was 31 months (95% CI, 15.0 to 47.0; P = .421). The 2-year overall survival rate was 48% in patients with PCF and 57% in those without PCF (P = .290).

Conclusion

In the present study, previous CRT, hypopharynx malignancy, low preoperative albumin level (less than 40 g/L), longer duration of surgery, more-extensive pharyngeal resection, and flap reconstruction were identified as the main predictive factors for PCF. Nevertheless, the lower

incidence of PCF in the patients who underwent prosthetic surgical voice restoration still suggests that this method to restore oral communication and thus the quality of life after TL is relatively safe and probably has no relationship to PCF even in salvage surgery.

Kishikova et al. 2014

Title

Oral feeding following laryngectomy: early or delayed?

Authors

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Journal and year of publication

Int J Surg. 2014 Nov;12(11):1137-40.

Type of publication

Systematic review

Objective

The question addressed was: In patients having undergone laryngectomy, does the timing of oral feeding lead to a higher post-operative complication rate?

Subjects and Methods

A best evidence topic in otolaryngology was written according to a structured protocol. 172 papers were found using the described protocol. Five of these papers were chosen to describe the best evidence to address the question. The authors, date and country of publication, study type, patient group, outcomes and key results of these papers have been represented in a table.

Results

All studies demonstrate that initiation of early feeding in patients post-laryngectomy provides no increased risk of development of pharyngocutaneous fistulas than delayed initiation of feeding. One study demonstrated a statistically significant reduction in hospitalisation of patients after early post-operative feeding.

Conclusion

This review can conclude that contrary to historical opinion, the best evidence currently available fails to demonstrate any increased rate of pharyngocutaneous fistula formation when initiating an early oral feeding regimen. Timing of this intervention by consensus would appear optimal at 48 h. In appropriately selected patients, there is no evidence against early feeding. Despite problems with study design, the literature concludes that early feeding is as safe as delayed feeding and may reduce the hospitalisation period. Further powered studies are

required before recommendations on explicit inclusion criteria and feeding regimen details can be made.

Link to free download
https://www.journal-surgery.net/article/S1743-9191(14)00897-8/pdf

Sousa et al. 2014

Title

Does early oral feeding increase the likelihood of salivary fistula after total laryngectomy?

Authors

Sousa AA[1], Porcaro-Salles JM[1], Soares JM[2], de Moraes GM[1], Silva GS[1], Sepulcri RA[2], Savassi-Rocha PR[1].

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Journal and year of publication

J Laryngol Otol. 2014 Apr 15:1-7.

Type of publication

Randomized case-control study

Objective

This study compared the incidence of salivary fistula between groups with an early or late reintroduction of oral feeding, and identified the predictive factors for salivary fistula.

Subjects and Methods

A randomised trial was performed using 89 patients with larynx or hypopharynx cancer, assigned to 2 groups (early or late). In the early group, oral feeding was started 24 hours after total laryngectomy or total pharyngolaryngectomy, and in the late group, it was started from post-operative day 7 onwards. The occurrence of salivary fistula was evaluated in relation to the following variables: early or late oral feeding, nutritional status, cancer stage, surgery performed, and type of neck dissection.

Results

The incidence of salivary fistula was 27.3 per cent (n = 12) in the early group and 13.3 per cent (n=6) in the late group (p = 0.10). The following variables were not statistically significant: nutritional status (p = 0.45); tumour location (p = 0.37); type of surgery (p = 0.91) and type of neck dissection (p = 0.62). A significant difference (p = 0.02) between the free margins and invasive carcinoma was observed.

Conclusion

The early reintroduction of oral feeding in total pharyngolaryngectomy or total laryngectomy patients does not appear to increase the likelihood of salivary fistula. The results suggest that surgical margin involvement by invasive carcinoma is an independent risk factor for salivary fistula.

Aires et al. 2012

Title

[Pharyngocutaneous fistula following total laryngectomy].

Authors

Aires FT[1], Dedivitis RA, Castro MA, Ribeiro DA, Cernea CR, Brandão LG.

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Journal and year of publication

Braz J Otorhinolaryngol. 2012 Dec;78(6):94-8.

Type of publication

Retrospective cohort study

Objective

To establish the incidence of this complication and to analyze the predisposing factors.

Subjects and Methods

This is a cross-sectional study of a historical cohort including 94 patients who underwent total laryngectomy. The following aspects were correlated to the occurrence of PCF: gender, age, tumor site, TNM staging, type of neck dissection, previous radiation therapy, previous tracheotomy, and use of stapler for pharyngeal closure. The following were considered in PCF cases: the day into postoperative care when the fistula was diagnosed, duration of occurrence, and proposed treatment.

Results

Twenty (21.3%) patients had PCF. The incidence of PCF was statistically higher in T4 tumors when compared to T2 and T3 neoplasms ($p = 0.03$). The other analyzed correlations were not statistically significant. However, 40.9% of the patients submitted to tracheostomy previously had fistulae, against 21.1% of the patients not submitted to this procedure.

Conclusion

Advanced primary tumor staging is correlated with higher incidences of PCF.

Eustaquio et al. 2009

Title

Early oral feeding after salvage laryngectomy.

Authors

Eustaquio M[1], Medina JE, Krempl GA, Hales N.

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Journal and year of publication

Head Neck. 2009 Oct;31(10):1341-5.

Type of publication

Retrospective review

Objective

Our aim was to determine the feasibility and safety of initiating early oral feeding in patients who underwent salvage laryngectomy on postoperative day 5 and to review the rate of pharyngocutaneous fistula formation.

Subjects and Methods

A retrospective review of 29 patients who underwent salvage laryngectomy was completed. Patients included in the study had radiation therapy +/- chemotherapy for laryngeal squamous cell carcinoma with subsequent total laryngectomy. Patients were excluded from analysis if they were reliant on a gastrostomy tube preoperatively, had a concurrent complete glossectomy, or developed a fistula before beginning oral feedings. Early oral feeding was initiated on postoperative day 5.

Results

Twenty patients met complete inclusion criteria. Pharyngocutaneous fistula occurred in 10% (2/20) of the patients. Patients without postoperative complications on an average remained in the hospital for 7 days.

Conclusion

The risk of fistula formation is not increased and the duration of hospital stay may be shortened in patients who were given early postoperative feeds. The practice of early oral intake in salvage laryngectomy is feasible and safe.

The action of swallowing and the exposure of the incisions to saliva and other fluids may cause additional strain on the closure, thereby leading to the practice of withholding oral feeding until the closure has enough tensile strength to withstand such forces. However, in the first 24 to 48 hours postoperatively, patients usually begin swallowing their own saliva. These factors cannot be completely avoided, but the question remains as to whether or not the addition of oral

intake exacerbates such stresses. This has not been adequately answered in the literature and is not specifically addressed in this study. It may, however, be extrapolated that beginning oral feeding early in the postoperative coarse does not lead to an increase in breakdown of the wound anastomosis.

Seven et al. 2003

Title

A randomized controlled trial of early oral feeding in laryngectomized patients.

Authors

Seven H[1], Calis AB, Turgut S.

Affiliations

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Journal and year of publication

Laryngoscope. 2003 Jun;113(6):1076-9.

Type of publication

Prospective randomized controlled study

Objective

Aim to evaluate the safety and efficacy of early oral feeding by comparing it with feeding through primary tracheoesophageal puncture after total laryngectomy with primary pharyngeal closure.

Subjects and Methods

Patients who underwent total laryngectomy with primary pharyngeal closure and who were candidates for primary voice restoration (an in whose cases primary tracheoesophageal puncture [TEP] was created) were included. After total laryngectomy, patients were randomly assigned to either the oral group (study group) or the TEP group (control group). Patients in the oral group were fed orally with a clear liquid diet on the first postoperative day, then advanced to a regular diet, whereas patients in the TEP group were fed through tracheoesophageal puncture and received nothing orally until the seventh postoperative day; then they were fed orally if fistula had not occurred. Standard criteria for discharge were used for all the patients.

Results

During a 3-year period, 67 patients were enrolled in the trial, and complete data were available for 65 patients (32 patients in the oral group, 33 patients in the TEP group). The two groups were similar for factors reported to influence the rate of pharyngocutaneous fistula. In three (9%) patients in the TEP group, fistula occurred on the 5th, 7th, and 14th postoperative days, respectively. Two (6.2%) fistulas occurred in the oral group on the sixth and eighth postoperative days, respectively. In patients without fistula, the mean length of hospital stay was 7.6 days (range, 4-19 d [SD = 3.1 d]) for the oral group and 8.2 days (range, 7-18 d [SD = 2.6 d) for the TEP group. There was no significant difference between two groups for either the incidence of fistula or the length of hospital stay.

Conclusion

Initiation of oral feeding on the first postoperative day in patients undergoing total laryngectomy with primary pharyngeal closure is a safe clinical practice. We are of the opinion that early oral

feeding should be considered as a good alternative to feeding through NGT, particularly in patients who did not have a TEP. In this way, the need for the NGT could be eliminated, and patients also could be spared the inconvenience of it. Although the incidence of PCF and the length of hospital stay did not show significant differences between the groups, we think that the positive psychological aspect of early oral feeding may have a significant impact on the entire recovery process because patients and their relatives believed that early initiation of oral feeding with regular solid diets would hasten their recovery.

Table of PCF rates in comparative studies in patients receiving early vs. late oral feeding

Author (year)	Patient group (n)		First day of oral feeding post TL (days)		Number of PCFs/total group (%)		*p*-value
	early	late	early	late	early	late	
Medina (2001)	20	18	<2	7-10	1/20 (5%)	2/18 (11%)	p>0.05
Seven (2003)	32	33	1	>7	2/32 (6.2%)	3/33 (9%)	p>0.05
Prasad (2006)	40	38	2	7-10	1/40 (2.5%)	2/38 (5.2%)	p>0.05
Aswani (2009)	40	39	2	7	8/40 (20 %)	6/39 (15.4 %)	p=0.592
Sousa (2014)	44	45	1	7	12/44 (27.3%)	6/45 (13.3%)	p = 0.10
Timmermans (2014)	107	140	2-4	10-12	34/107 (31.8%)	35/140 (25%)	p = 0.255
Serbanescu Kele (2015)	36	30	3-5	7-10	6/36 (17 %)	6/30 (20%)	p>0.05
Süslü (2016)	580	22	<5	>5	69/580 (11.9%)	3/22 (13.6%)	p = 0.722

The publications listed below concern the publications regarding feeding after total laryngectomy and the incidence of pharyngocutaneous fistula formation that are referenced above. Clicking the link while holding the Ctrl key will take you directly to the summary you are interested in

Medina JE, Khafif A. Early oral feeding following total laryngectomy. Laryngoscope. 2001 Mar;111(3):368-72.

Seven H, Calis AB, Turgut S. A randomized controlled trial of early oral feeding in laryngectomized patients. Laryngoscope. 2003 Jun;113(6):1076-9.

Prasad KC, Sreedharan S, Dannana NK, Prasad SC, Chandra S. Early oral feeds in laryngectomized patients. Ann Otol Rhinol Laryngol. 2006 Jun;115(6):433-8.

Aswani J, Thandar M, Otiti J, Fagan J. Early oral feeding following total laryngectomy. J Laryngol Otol. 2009 Mar;123(3):333-8.

Sousa AA, Porcaro-Salles JM, Soares JM, de Moraes GM, Silva GS, Sepulcri RA, Savassi-Rocha PR. Does early oral feeding increase the likelihood of salivary fistula after total laryngectomy? J Laryngol Otol. 2014 Apr 15:1-7.

Timmermans AJ, Lansaat L, Kroon GV, Hamming-Vrieze O, Hilgers FJ, van den Brekel MW. Early oral intake after total laryngectomy does not increase pharyngocutaneous fistulization. Eur Arch Otorhinolaryngol. 2014 Feb;271(2):353-8.

Serbanescu Kele CM, Halmos GB, Wedman J, van der Laan BF, Plaat BE. Early feeding after total laryngectomy results in shorter hospital stay without increased risk of complications: a retrospective case-control study. Clin Otolaryngol. 2015 Dec;40(6):587-92.

Süslü N, Sefik HA. Early oral feeding after total laryngectomy: Outcome of 602 patients in one cancer center. Auris Nasus Larynx. 2016 Oct;43(5):546-50.