Supplementary material

Serious complications associated with nasogastric, orogastric, or enteral tube misplacement over the decades: a systematic review

# Supplementary material 1

PubMed search string

(511 results, 06 April 2024)

(nasogastric feeding tube (ti) or nasogastric tube (ti) or Naso gastric Tube (ti) or feeding tube (ti)) AND (case report or case series) NOT (administration (ti) or gastrostomy (tiab) or infusion (ti) or treatment through (ti) or peg (ti) or horse (ti) or horses (ti) or percutaneous (ti) or transgastric (ti) or esophageal atresia (ti) or D-PEJ (ti) or atresia (ti) or given via (ti) or jejunostomy (ti))

Supplementary Table 1. PRISMA Checklist.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Section and Topic | | Item # | Checklist item | Location where item is reported |
| TITLE | | | |  |
| Title | | 1 | Identify the report as a systematic review. | Pag. 1 |
| ABSTRACT | | | |  |
| Abstract | | 2 | See the PRISMA 2020 for Abstracts checklist. | Pag. 1 |
| INTRODUCTION | | | |  |
|  | Rationale | 3 | Describe the rationale for the review in the context of existing knowledge. | Pag. 1, 2 |
| Objectives | 4 | Provide an explicit statement of the objective(s) or question(s) the review addresses. | Pag. 1, 2 |
| METHODS | | | |  |
|  | Eligibility criteria | 5 | Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses. | Pag. 2, 3 + **Supplementary Table 2** |
| Information sources | 6 | Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted. | Pag. 2 |
| Search strategy | 7 | Present the full search strategies for all databases, registers and websites, including any filters and limits used. | Pag. 2 |
|  | Selection process | 8 | Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process. | Pag. 2 |
| Data collection process | 9 | Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process. | Pag. 3 |
| Data items | 10a | List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (*e.g.*, for all measures, time points, analyses), and if not, the methods used to decide which results to collect. | Pag. 3 |
| 10b | List and define all other variables for which data were sought (*e.g.,* participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information. | Pag. 3 |
| Study risk of bias assessment | 11 | Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process. | NA |
| Effect measures | 12 | Specify for each outcome the effect measure(s) (*e.g.,* risk ratio, mean difference) used in the synthesis or presentation of results. | Pag. 3 |
| Synthesis methods | 13a | Describe the processes used to decide which studies were eligible for each synthesis (*e.g.,* tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)). | Pag. 3 |
| 13b | Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions. | Pag. 3 |
| 13c | Describe any methods used to tabulate or visually display results of individual studies and syntheses. | Pag. 3 |
| 13d | Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used. | Pag. 3 |
| 13e | Describe any methods used to explore possible causes of heterogeneity among study results (*e.g.,* subgroup analysis, meta-regression). | NA |
| 13f | Describe any sensitivity analyses conducted to assess robustness of the synthesized results. | NA |
| Reporting bias assessment | 14 | Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases). | NA |
| Certainty assessment | 15 | Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome. | NA |
| RESULTS | | | | |
|  | Study selection | 16a | Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram. | Pag. 3–6 |
| 16b | Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded. | **Supplementary Table 3** |
| Study characteristics | 17 | Cite each included study and present its characteristics. | **Supplementary Table 2** |
| Risk of bias in studies | 18 | Present assessments of risk of bias for each included study. | NA |
| Results of individual studies | 19 | For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (*e.g.,* confidence/credible interval), ideally using structured tables or plots. | Pag 3–6, Tables 1,2,3,4 |
| Results of syntheses | 20a | For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies. | Pag 3–6, Tables 1,2,3,4 |
| 20b | Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (*e.g.,* confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect. | Pag 3–6, Tables 1,2,3,4 |
| 20c | Present results of all investigations of possible causes of heterogeneity among study results. | Pag 3–6, Tables 1,2,3,4 |
| 20d | Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results. | NA |
| Reporting biases | 21 | Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed. | NA |
| Certainty of evidence | 22 | Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed. | NA |
| DISCUSSION | | | | |
|  | Discussion | 23a | Provide a general interpretation of the results in the context of other evidence. | Pag. 7 |
| 23b | Discuss any limitations of the evidence included in the review. | Pag. 7 |
| 23c | Discuss any limitations of the review processes used. | Pag. 7 |
| 23d | Discuss implications of the results for practice, policy, and future research. | Pag. 7 |
| OTHER INFORMATION | | | | |
|  | Registration and protocol | 24a | Provide registration information for the review, including register name and registration number, or state that the review was not registered. | Pag. 1, 2 |
| 24b | Indicate where the review protocol can be accessed, or state that a protocol was not prepared. | Pag. 1, 2 |
| 24c | Describe and explain any amendments to information provided at registration or in the protocol. | NA |
| Support | 25 | Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review. | Pag. 8 |
| Competing interests | 26 | Declare any competing interests of review authors. | Pag. 8 |
| Availability of data, code and other materials | 27 | Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review. | Pag. 8 |

NA: not available.

Supplementary Table 2. List of included studies.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| First Author | Year | Journal | Title | PMID |
| Guthrie DB | 2020 | Anesth Prog. | Tracheopulmonary Complications of a Malpositioned Nasogastric Tube. | 32992338 |
| Cao W | 2020 | Radiol Case Rep | Malposition of a nasogastric feeding tube into the right pleural space of a poststroke patient | PMC7452070 |
| Hardy JP | 2020 | J Belg Soc Radiol | Hazardous Removal of a Misplaced Nasogastric Tube | 32832848 |
| Leow TH | 2020 | BMJ Case Rep. | Rare and dangerous complication of nasogastric tube insertion | 32532895 |
| Lim JY | 2019 | J Surg Case Rep | A simple procedure gone wrong: pneumothorax after inadvertent transbronchial nasogastric tube insertion necessitating operative management | 31214323 |
| Le Mouel JP | 2018 | Endoscopy. | Double lumen esophagus due to false submucosal path induced by nasogastric tube: endoscopic treatment with marsupialization | 30184606 |
| Mohiuddin SA | 2017 | Qatar Med J | Down the wrong road - a case report of inadvertent nasogastric tube insertion leading to lung laceration and important pearls to avoid complications | 28534005 |
| Seebacher J | 1975 | Anesthesiology | Inadvertent intracranial introduction of a nasogastric tube, a complication of severe maxillofacial trauma | 1111361 |
| Joseph TT | 2015 | Saudi J Anaesth. | Self-expanding metal stents for esophageal perforation with nasogastric tube insertion in esophageal carcinoma | 25558217 |
| Kannappan O. | 2015 | ANZ J Surg. | Havoc caused by nasogastric tube: lesson to be learned | 25404265 |
| Cotta MO | 2015 | ANZ J Surg. | Post-operative iatrogenic pneumothorax and associated mortality: lessons learnt | 25580580 |
| Karamchandani K | 2015 | Endoscopy | A pseudopyloric channel created by repeated blind post-pyloric feeding tube placement | 26528683 |
| Lübbe-Vázquez CF | 2015 | Med Intensiva. | (Nasogastric feeding tube with distal tip in right pleural cavity) | 25728616 |
| Isik A | 2014 | Am J Case Rep. | A case report of esophageal perforation: Complication of nasogastric tube placement | 24803977 |
| Joseph TT | 2014 | Anesth Essays Res. | Rare complication of nasogastric tube insertion | 25886122 |
| Heng LH | 2013 | Med J Malaysia. | Case of lung perforation secondary to nasogastric tube insertion | 24145270 |
| Khasawneh FA | 2013 | BMJ Case Rep. | Nasopharyngeal perforation by a new electromagnetically visualised enteral feeding tube | 23709151 |
| Leonard S | 2012 | Ir Med J. | Complications of nasogastric tube placement—don’t blow it | 22708227 |
| Kuhner A | 1977 | J Neurosurg. | Complications of nasogastric intubation | 925755 |
| Hanna AS | 2011 | Am J Otolaryngol | Inadvertent insertion of nasogastric tube into the brain stem and spinal cord after endoscopic skull base surgery | 21715048 |
| Liang TJ | 2011 | Clin Gastroenterol Hepatol. | Small bowel perforation by nasogastric tube | 21377550 |
| Lyske J. | 2011 | BMJ Case Rep. | A rare complication of nasogastric tube insertion | 22679328 |
| Hensel M | 2010 | Anaesthesist | (Pneumothorax following nasogastric feeding tube insertion: Case report and review of the literature) | 20119660 |
| Hirshoren N | 2009 | J Trauma. | Retropharyngeal infected hematoma: a unique complication of nasogastric tube insertion | 19820602 |
| Hutchinson R | 2008 | Ann R Coll Surg Engl. | A case of intramural oesophageal dissection secondary to nasogastric tube insertion | 18831861 |
| Makay O | 2008 | ANZ J Surg. | Pyriform sinus perforation secondary to nasogastric tube insertion | 18593431 |
| Kawati R | 2005 | Acta Anaesthesiol Scand. | Malpositioning of fine bore feeding tube: a serious complication | 15675983 |
| Kawati R | 2005 | Acta Anaesthesiol Scand. | Malpositioning of fine bore feeding tube: a serious complication | 15675983 |
| Kawati R | 2005 | Acta Anaesthesiol Scand. | Malpositioning of fine bore feeding tube: a serious complication | 15675983 |
| Metheny NA. | 2002 | Am J Nurs. | Inadvertent intracranial nasogastric tube placement | 12394035 |
| Ho KM. | 1999 | Intensive Care Med. | Tension pneumothorax following removal of a misplaced fine-bore feeding tube in an unintubated patient | 10229174 |
| Kannan S | 1999 | Anaesthesia | Tension pneumothorax and pneumomediastinum after nasogastric tube insertion | 10541695 |
| Kolbitsch C | 1997 | Intensive Care Med. | Pneumothorax following nasogastric feeding tube insertion in a tracheostomized patient after bilateral lung transplantation | 9142585 |
| Jaffe PE | 1994 | J Clin Gastroenterol. | Esophagogastric tract formation without free perforation during routine nasogastric tube placement | 7963368 |
| Nakano Y | 1996 | Nihon Kyobu Shikkan Gakkai Zasshi. | (Pneumothorax from a nasogastric feeding tube) | 8717293 |
| Katz MI | 1994 | AJR Am J Roentgenol. | Inadvertent intracranial placement of a nasogastric tube | 8010228 |
| Ibarra-Pérez C. | 1992 | Rev Invest Clin. | (Lung perforation by a small-bore enteral feeding tube) | 1439315 |
| Khan MS | 1987 | J Am Geriatr Soc. | Pneumothorax complicating small-bore nasogastric feeding tube insertion | 3119694 |
| Konarzewski WH | 1986 | Anaesthesia. | Pneumothorax following insertion of a nasogastric tube | 3089055 |
| Grossman TW | 1984 | Ann Otol Rhinol Laryngol. | Complications associated with a narrow bore nasogastric tube | 6497239 |
| Grossman TW | 1984 | Ann Otol Rhinol Laryngol. | Complications associated with a narrow bore nasogastric tube | 6497239 |
| Moustoukas N | 1983 | South Med J. | Intracranial placement of nasogastric tube: an unusual complication | 6857317 |
| Saltzberg DM | 1984 | JPEN J Parenter Enteral Nutr. | Feeding tube-induced pneumothorax | 6441017 |
| Hollimon PW | 1981 | Arch Surg. | Pneumothorax attributable to nasogastric tube | 7259500 |
| Guerra B | 1979 | Surg Neurol. | Intracranial introduction of a nasogastric tube in a patient with a pituitary tumor | 515905 |
| Gustavsson S | 1978 | Acta Chir Scand. | The accidental introduction of the nasogastric tube into the brain. Case report | 654837 |
| James RH. | 1978 | Anaesthesia. | An unusual complication of passing a narrow bore nasogastric tube | 717714 |
| Lind LJ | 1978 | Anesthesiology. | Submucosal passage of a nasogastric tube complicating attempted intubation during anesthesia | 686424 |
| AlHafidh OZ | 2020 | Cureus | Using Video-Assisted Laryngoscope (GlideScope®) to Insert a Nasogastric Tube and Prevent Pneumothorax From Incorrectly Inserted Nasogastric Tubes | 32850260 |
| Granados G | 2020 | Arch Bronconeumol. | Iatrogenic Pneumothorax Following Nasogastric Tube Misplacement | 31653337 |
| Tiller HJ | 1984 | Am J Surg. | Iatrogenic perforation of the esophagus by a nasogastric tube | 6703218 |
| Chakraborty R | 2018 | Indian J Crit Care Med. | A Case of Unusual Occurrence of Nasogastric Tube Feed Coming Through the Chest Tube in a 27-Year-Old Polytrauma Patient | 30111934 |
| Dandpat SK | 2018 | Neurol India. | Not a refugee, nasogastric tube in the brain: Modes of prevention and controversies in management | 29547180 |
| Goswami U | 2018 | Korean J Anesthesiol. | Unusual false passage formation during nasogastric tube insertion in an anesthetized patient | 29764008 |
| Olbrantz KR | 1985 | JPEN J Parenter Enteral Nutr. | Pneumothorax complicating enteral feeding tube placement | 3921736 |
| Fakih HAM | 2017 | Intensive Care Med. | A nasoenteral feeding tube barking up the wrong tree | 28124087 |
| Andresen EN | 2016 | J Med Case Rep | Deadly pressure pneumothorax after withdrawal of misplaced feeding tube: a case report | 26846268 |
| Al Saif N | 2015 | Case Rep Crit Care | Tension Pneumothorax and Subcutaneous Emphysema Complicating Insertion of Nasogastric Tube | 26448883 |
| Sheffner SE | 1985 | J Can Assoc Radiol. | Iatrogenic bronchopleural fistula caused by feeding tube insertion | 3920221 |
| Fonseca VR | 2015 | Intensive Care Med. | Placement of nasogastric tube complicated by hydropneumothorax | 25904187 |
| Araimo F | 2014 | HSR Proc Intensive Care Cardiovasc Anesth. | Intracranial placement of a nasogastric tube in a non-trauma patient | 23441265 |
| Amirlak B | 2012 | Acta Med Iran. | Pneumothorax following feeding tube placement: precaution and treatment | 22837092 |
| Amirlak B | 2012 | Acta Med Iran. | Pneumothorax following feeding tube placement: precaution and treatment | 22837092 |
| Felipe-Silva A | 2012 | Autops Case Rep. | “Nutrothorax” complicating a misplaced nasogastric feeding tube in a severely ill patient | 31528557 |
| Agha R | 2011 | JRSM Short Rep | Pneumothorax after nasogastric tube insertion | 21541076 |
| Scholten DJ | 1986 | Am Surg. | Pneumothorax from nasoenteric feeding tube insertion. A report of five cases | 3089085 |
| Benzagmout M | 2010 | Ann Fr Anesth Reanim. | (Tracheal rupture by nasogastric tube) | 20188508 |
| Chandra R | 2010 | Neurol India. | Intracranial introduction of a nasogastric tube in a patient with severe craniofacial trauma | 21045526 |
| Freeberg SY | 2010 | J Intensive Care Med. | Case series: Tension pneumothorax complicating narrow-bore enteral feeding tube placement. | 20622259 |
| Freeberg SY | 2010 | J Intensive Care Med. | Case series: Tension pneumothorax complicating narrow-bore enteral feeding tube placement. | 20622259 |
| Bini A | 2004 | Ann Thorac Surg. | Spontaneous biliopneumothorax (thoracobilia) following gastropleural fistula due to stomach perforation by nasogastric tube | 15223464 |
| Genú PR | 2004 | J Oral Maxillofac Surg | Inadvertent intracranial placement of a nasogastric tube in a patient with severe craniofacial trauma: a case report | 15510370 |
| Agarwal A | 2002 | Anesth Analg. | Nasogastric tube knotting over the epiglottis: a cause of respiratory distress | 12032048 |
| Ferreras J | 2000 | Oral Surg Oral Med Oral Pathol Oral Radiol Endod | Intracranial placement of a nasogastric tube after severe  Intracranial placement of a nasogastric tube after severe  craniofacial trauma | 11077377 |
| Chou TD | 1999 | Burns. | Duodenal perforation as a complication of routine endoscopic nasoenteral feeding tube placement | 10090391 |
| Ahmed A | 1998 | Am J Emerg Med. | Esophageal perforation: a complication of nasogastric tube placement | 9451317 |
| Carrillo E | 1998 | Can J Anaesth. | Intrapleural placement of a nasogastric tube | 9579277 |
| Düthorn L | 1998 | Anesthesiology | Accident Intravascular Placement of Feeding Tube | 9667314 |
| Castiglione A | 1998 | Am J Forensic Med Pathol. | Intracranial insertion of a nasogastric tube in a case of homicidal head trauma | 9885926 |
| Freij RM | 1997 | J Accid Emerg Med | Inadvertent intracranial insertion of a nasogastric tube in a non-trauma patient | 9023626 |
| Fisman DN | 1996 | Can J Anaesth. | Intrapleural placement of a nasogastric tube: an unusual complication of nasotracheal intubation | 8955977 |
| Casagli S | 1994 | Minerva Anestesiol. | Accidental introduction of a naso-gastric tube into the cranial cavity in a patient with non-severe cranial and facial trauma | 7936344 |
| Estebe JP | 1994 | Ann Fr Anesth Reanim. | (Intracranial insertion of a nasogastric tube in a patient with severe head injuries) | 7668423 |
| Armengol Sáez S | 1993 | Rev Clin Esp. | (Pneumothorax secondary to the placing of a nasogastric feeding tube: 2 new cases) | 8511382 |
| Armengol Sáez S | 1993 | Rev Clin Esp. | (Pneumothorax secondary to the placing of a nasogastric feeding tube: 2 new cases) | 8511382 |
| Adler JS | 1992 | CMAJ | Inadvertent intracranial placement of a nasogastric tube in a patient with severe head trauma | 1521212 |
| Glasser SA | 1990 | AJNR Am J Neuroradiol. | Intracranial complication during insertion of a nasogastric tube | 2124050 |
| Choh JH | 1988 | IMJ Ill Med J. | Misplacement of the narrow-bore feeding tube | 2906929 |
| Balogh GJ | 1983 | AJR Am J Roentgenol. | Pneumothorax as a complication of feeding tube placement | 6417991 |
| Culpepper JA | 1982 | Chest. | Malpositioned nasogastric tube causing pneumothorax and bronchopleural fistula | 7056121 |
| Borovich B | 1981 | Neurosurgery. | Intracranial penetration of nasogastric tube | 7207793 |
| Borovich B | 1981 | Neurosurgery. | Intracranial penetration of nasogastric tube | 7207793 |
| Galloway DC | 1979 | South Med J. | Inadvertent intracranial placement of a nasogastric tube through a basal skull fracture | 424807 |
| Fremstad JD | 1978 | J Trauma. | Lethal complication from insertion of nasogastric tube after severe basilar skull fracture | 731747 |
| Walmsley CJ | 2020 | Anaesth Rep. | Intra-abdominal nasogastric tube placement following inadvertent nasopharyngeal perforation | 32537612 |
| Yanagawa Y. | 2020 | Acute Med Surg. | Pneumothorax induced by the incorrect insertion of a nasogastric tube. | 33204432 |
| Paparoupa M | 2019 | Intensive Care Med. | Nasogastric tube ending in the right pleura of an intubated patient | 30430210 |
| Yamada T | 2019 | Am J Case Rep | Nasogastric Tubes Can Cause Intramural Hematoma of the Esophagus | 30783075 |
| Zhang X | 2019 | World Neurosurg. | Nasogastric Tube Feeding into Brain After Endoscopic Endonasal Transsphenoidal Surgery | 31421302 |
| Numata Y | 2018 | Int J Surg Case Rep | Perforation of abdominal esophagus following nasogastric feeding tube intubation: A case report | 29573599 |
| Stefani A | 2018 | Intensive Care Med. | An unusual drain in the pleural cavity: iatrogenic pneumothorax due to pulmonary misplacement of a nasogastric tube. | 29974170 |
| Smith KA | 2017 | J Surg Case Rep. | A case of fatal internal jugular vein perforation during nasogastric tube insertion | 28721190 |
| Sano N | 2016 | World J Gastroenterol. | Nasogastric tube syndrome induced by an indwelling long intestinal tube | 27099450 |
| Saraceni E | 2016 | Anesthesiology. | Images in Anesthesiology: Bronchopleural Fistula Caused by the Incorrect Placement of the Enteral Feeding Tube | 27649428 |
| van Kerckhoven G | 2016 | Intensive Care Med. | Dedicated NAVA enteral feeding tube placement complicated by a hydropneumothorax but producing a correct EAdi signal | 26202041 |
| Yang CW | 2016 | Dis Esophagus. | Esophageal submucosal tunnel: a rare complication of nasogastric  tube placement | 23890220 |
| Resch TR | 2014 | Eplasty. | Pulmonary injury secondary to feeding tube misplacement | 25210575 |
| Ruggieri L | 2014 | BJA | An unforeseen route for a nasoenteral feeding tube | 10.1093/bja/el\_11111 |
| Taylor SJ | 2014 | Br J Nurs. | Undetected oesophageal perforation and feeding-tube misplacement | 25345450 |
| Paul V | 2013 | BMJ Case Rep. | Pneumothorax occurring after nasogastric tube removal | 24296770 |
| Paul V | 2013 | BMJ Case Rep. | Severe epistaxis after nasogastric tube insertion requiring arterial embolisation | 23334489 |
| Van Dinter TG Jr | 2013 | Proc (Bayl Univ Med Cent). | Intestinal perforation caused by insertion of a nasogastric tube late after gastric bypass. | 23382601 |
| Zachariah SK. | 2013 | Case Rep Surg. | Laparoscopic repair of a large duodenal perforation secondary to an indwelling nasogastric tube in a tracheotomized adult | 23573453 |
| Sweta K | 2012 | Indian J Crit Care Med. | Inadvertent insertion of nasogastric tube into the trachea of a conscious patient | 22988372 |
| Viteri G | 2012 | J Vasc Interv Radiol. | Nasogastric tube found in the right atrium | 22525029 |
| Psarras K | 2011 | Clin Imaging | Inadvertent insertion of a nasogastric tube into the brain: case report and review of the literature | 22920367 |
| Roka YB | 2010 | Neurol India. | Fatal inadvertent intracranial insertion of a nasogastric tube | 21045525 |
| Tong Z | 2010 | J Med Case Rep. | Duodenal perforation due to a kink in a nasojejunal feeding tube in a patient with severe acute pancreatitis: a case report | 20509898 |
| Ronen O | 2009 | Ear Nose Throat J. | A case of nasogastric tube perforation of the nasopharynx causing a fatal mediastinal complication | 19750464 |
| Wang PC | 2008 | J Chin Med Assoc. | Inadvertent tracheobronchial placement of feeding tube in a mechanically ventilated patient | 18653401 |
| Zausig YA | 2008 | Minerva Anestesiol. | Occurrence of a pneumothorax secondary to malpositioned nasogastric tube: a case report | 18946433 |
| Vahid B. | 2007 | Intern Med J. | Inadvertent placement of a feeding tube in brainstem and spinal cord | 17640194 |
| Weinberg L | 2006 | Anaesth Intensive Care. | Pneumothorax from intrapleural placement of a nasogastric tube | 16617654 |
| Wu PY | 2006 | J Formos Med Assoc. | Fatal massive hemorrhage caused by nasogastric tube misplacement in a patient with mediastinitis | 16440075 |
| Rahimi-Movaghar V | 2005 | Acta Neurochir (Wien) | Intracranial placement of a nasogastric tube. A lesson to be re-learnt? | 15625586 |
| Selcuk H | 2005 | Cardiovasc Intervent Radiol. | Endovascular treatment of persistent epistaxis due to pseudoaneurysm formation of the ophthalmic artery secondary to nasogastric tube | 15883862 |
| O'Neil R | 2004 | Australas Radiol | Intrapleural nasogastric tube insertion | 15230746 |
| Pandey AK | 2004 | J Assoc Physicians India | Inadvertent insertion of nasogastric tube into the brain | 15636338 |
| Winterholler M | 2002 | Arch Phys Med Rehabil. | Accidental pneumothorax from a nasogastric tube in a patient with severe hemineglect: a case report | 12161843 |
| Yavaşcaoğlu B | 2001 | J Int Med Res. | Fatal hydrothorax due to misplacement of a nasoenteric feeding tube | 11725832 |
| Robinson P | 1999 | Eur Radiol. | Intra-abdominal oesophageal perforation following naso-gastric tube insertion | 10525893 |
| Wendell GD | 1991 | Arch Intern Med. | Pneumothorax complicating small-bore feeding tube placement | 1848058 |
| Sofferman RA | 1990 | Laryngoscope. | The nasogastric tube syndrome | 2395406 |
| Sudo G | 2020 | BMJ Case Rep | Haemorrhagic exfoliative oesophagitis associated with nasogastric tube placement | 33229484 |
| Nie F | 2020 | British Journal of Nursing | Oesophageal mucosal tears caused  by suboptimal nasogastric tube insertion: a case study | 33325297 |
| Kanbayashi T | 2021 | Internal Medicine | Nasogastric Tube Syndrome: The Size and Type of the Nasogastric Tube May Contribute to the Development of Nasogastric Tube Syndrome | 33518566 |
| Gohar A | 2021 | South Dakota Medicine | Inadvertent Nasogastric Tube Placement into the Left Bronchial Tree | 34449998 |
| Shafik C | 2021 | ANZ J Surg | Iatrogenic traumatic pontine injury from nasogastric tube insertion in a patient with an occult clival chordoma | 33484228 |
| Caballero-Mateos AM | 2021 | REV ESP ENFERM DIG | When routine gets complicated: gastric and splenic perforation by a nasogastric tube | 33611921 |
| Hussain MS | 2021 | Clin Case Rep | Line it up—Inadvertent placement of nasogastric tube in pleural space resulting in iatrogenic empyema | 34484764 |
| Ferrer-Inaebnit E | 2021 | CIRUGIA ESPANOLA | Oropharyngeal perforation secondary to nasogastric tube placement | 34332916 |
| Agrafiotis AC | 2021 | Acta Chirurgica Belgica | Misplacement of a nasogastric feeding tube with bronchial perforation | 34463222 |
| Zoghbi S | 2022 | Minerva anestesiologica | Internal necklace as a nasogastric tube placement complication | 34636227 |
| Chan D | 2022 | Respirology Case Rep | Iatrogenic empyema secondary to the malposition of a nasogastric tube | 36111323 |
| Ferreras J | 2000 | Oral Surg Oral Med Oral Pathol Oral Radiol Endod | Intracranial placement of a nasogastric tube after severe craniofacial trauma | 11077377 |
| Wyler AR | 1977 | J Neurosurg | An intracranial complication of nasogastric intubation. Case report | 731748 |

PMID: PubMed Identifier.

Supplementary Table 3. List of major excluded studies.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| First Author | Year | Journal | Title | PMID | Reason for exclusion |
| Osaka Y | 2019 | A A Pract. | A Missing Tooth Found in the Nasal Cavity After an Attempt at Insertion of a Nasogastric Tube: A Case Report | 31162167 | Overlapping population |
| Miura T | 2010 | Case Rep Gastroenterol. | A Fatal Aortoesophageal Fistula Caused by Critical Combination of Double Aortic Arch and Nasogastric Tube Insertion for Superior Mesenteric Artery Syndrome | 20805944 | Chronic damages |
| Haas LE | 2006 | Neth J Med. | “Nutrothorax” due to misplacement of a nasogastric feeding tube | 17122457 | Chronic damages |
| Falt P | 2015 | Gastrointest Endosc. | A case of tangled nasojejunal feeding tube and percutaneous transhepatic drain | 25922249 | Chronic damages |
| de Dominicis F | 2009 | J Chir (Paris) | Esophageal perforation during nasogastric tube insertion in a patient with right-sided aortic arch and thoracic aorta. Pathophysiology and surgical implications | 3604488 | Overlapping population |
| Ismail NJ | 2014 | Afr J Paediatr Surg. | Knotting of a nasogastric feeding tube in a child with head injury: A case report and review of literature | 25047325 | Knot |
| Kumar Sinha A | 2020 | Pediatr Investig. | Self-knotting of distal end of nasogastric tube-Not an uncommon possibility  Self-knotting of distal end of nasogastric tube-Not an uncommon possibility | 32851360 | Knot |
| Arora A | 2005 | Age Ageing | An unusual and overlooked complication of nasogastric tube feeding | 3612875 | Chronic damages |
| Apostolakis LW | 2001 | Head Neck | The nasogastric tube syndrome: two case reports and review of the literature | 2368902 | Chronic damages |
| Pereira F | 2020 | Rev Esp Enferm Dig | Misplacement of a nasogastric feeding tube: a case report | 28921275 | Chronic damages |
| Sano N | 2016 | World J Gastroenterol. | Catastrophic complication of an electromagnetic placed postpyloric feeding tube | 27099450 | Chronic damages |
| Hirwa KD | 2016 | Qatar Med J. | Knotted nasogastric tube in the posterior nasopharynx: A case report | 28058233 | Knot |
| Kipling M | 2011 | J Surg Case Rep. | Naso-pharyngeal entrapment. An unusual complication of naso-jejunal feeding tube insertion using a guidewire | 24950571 | Knot |
| Reading M | 2010 | Aust Crit Care | Chest X-ray quiz. Cardiomyopathy. The position of the nasogastric tube | 21539524 | Overlapping population |
| Melki I | 2010 | Am J Crit Care | Knotting of nasogastric tube around a nasotracheal tube: An unusual cause of hypercapnia in a 3-month-old infant | 19383761 | Knot |
| Dunn SA | 2019 | Anesthesiology | Ventilatory Collapse: Endotracheal Tube Strangulation from a Nasogastric Tube Knot | 30844947 | Knot |

PMID: PubMed Identifier.