The Management of Esophageal Perforations

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The successful handling of esophageal perforations has changed considerably during the past decade. Prior to 1940, esophageal perforation, regardless of the etiology involved, carried with it a fearful morbidity and unless surgical drainage was immediately instituted, a dependable mortality. In the recent literature, however, there have appeared several articles setting forth a newer concept regarding the management of known esophageal disruption with a sizable reduction in both morbidity and mortality statistics.1,2,3,5 The recent and rapid strides in thoracic surgery greatly aided by the coincidental discovery and production of versatile and germ destroying antibiotics has been responsible in a large measure for the altered approach to this catastrophe.

During the past four years 16 cases of esophageal perforation have been seen by us (D.J.D. and Paul C. Samson). The etiology concerned has varied widely and the treatment depended greatly on many factors which will be individually considered.

Case Reports

Case 1: A.G., aged 52, was admitted to the hospital because of an impacted food bolus within the lower esophagus. Esophagoscopy was performed under general anesthesia on June 4, 1949 without difficulty. During extraction of the bolus the patient's relaxation was inhibited by lightening of the anesthetic and there was considerable gagging. Perforation was not suspected and the endoscopic procedure required 25 minutes. Fourteen hours following, his temperature rose to 101 degrees F. and he complained of acute tenderness in the left cervical area. Palpation of the neck revealed tenderness and a small area of crepitus directly inferior to the left mastoid. Lipiodol swallow and a heavy film revealed mediastinal emphysema with suspended lipiodol in the cervical area. He was taken to surgery 25 hours following esophagoscopy where a linear tear in the posterior esophagus directly over the sixth cervical vertebra was repaired through a left cervical approach. Recovery was uneventful and he was discharged taking a regular diet seven days later. Intensive penicillin therapy was administered during his hospital stay.

Case 2: M.K., aged 29, a young girl circus performer entered the hospital on May 15, 1950 for diagnostic esophagoscopy in investigation of an unexplained dysphagia. The procedure was performed under general anesthesia and without difficulty. Extrinsic pressure, later proved to be caused by caseous tuberculous lymph nodes, was noted in the mid esophagus and the entire examination required approximately 40 minutes. Perforation was not suspected; however, immediately on awakening the patient complained of undue soreness in the cervical area and within 12
hours her temperature rose to 101 degrees F. There was point tenderness in the mid portion of the left sternomastoid muscle and she held her neck rigidly. High perforation was suspected and lipiodol swallow and comparative lateral cervical films confirmed this suspicion (Figures 1 and 2). Left anterior cervical mediastinotomy was performed on May 17, 1951, 41 hours following the perforation and a linear tear in the posterior wall of the esophagus directly over the sixth cervical vertebra was repaired over an indwelling Levine tube. Massive doses of penicillin, 600,000 units two times daily, were administered and the tube was removed within three days at which time liquid diet was started. She was discharged six days following esophagoscopy and was readmitted three weeks later when via right thoracotomy the lymph nodes were removed as well as an old abscess drained. She has since returned to her aerial occupation.

Case 3: G.S., aged 46, was admitted to the hospital for pre-operative investigation of an esophageal diverticulum. Esophagoscopy was performed on February 2, 1951, under general anesthesia and was carried out without incident. The time required for the procedure was 18 minutes. Twenty-four hours later he complained of pain on swallowing and slight tenderness in the left cervical area. Temperature was 100 degrees F. and there was slight leucocytosis (9500). Penicillin, intravenous therapy and nothing by mouth for 24 hours did not improve the situation. Tenderness in the neck was well localized over the mid portion of the left sternomastoid muscle where there was definite redness of the skin. The white cell count rose to 16,600 and cervical x-ray films showed an increase in mediastinal emphysema. Forty-eight hours following the esophagoscopy he was taken to surgery where anterior left cervical mediastinotomy was
performed. At the level of the seventh cervical vertebra between the posterior wall of the esophagus and the vertebra purulent foul-smelling material was encountered. No attempt was made at closure of the observed perforation. A tissue drain was inserted and the wound loosely closed. Mouth feedings were withheld for five days during which time penicillin and intravenous therapy were continued. The drain was removed on the third postoperative day and the patient was discharged 10 days after the drainage procedure, entirely asymptomatic.

Case 4: J.S., aged 61, was admitted to the hospital for investigation of a lower esophageal obstruction presumably due to a carcinoma. Esophagoscopy was performed under curare and pentathol anesthesia. Biopsy of a tumor at the cardiac end of the esophagus revealed adenocarcinoma and two hours following this 30 minute procedure bilateral cervical emphysema was present. Antibiotics in large doses were given, parenteral feedings instituted and his condition appeared to improve. However, four days later he became toxic, emphysema rapidly increased and 96 hours following perforation a foul-smelling abscess between the cervical vertebrae and the esophagus was drained through a left cervical mediastinotomy. His downward course continued and he expired 12 hours later.

Case 5: W.B., aged 40, choked while eating a pork chop 24 hours prior to our consultation. He felt a small piece of the bone lodge in his throat and consulted his family physician. With the patient in the sitting position an attempt was made to blindly pass a curved probe into the upper esophagus and this was immediately followed by a moderate hemorrhage. On admission to our service his temperature was 101 degrees F. and he complained of soreness in the throat. On April 22, 1947 under pentathol anesthesia esophagoscopy was performed and a red edematous esophageal orifice was seen. Immediately below the cricopharyngeal level

![FIGURE 3a](image1.png) ![FIGURE 3b](image2.png)

**Figures 3a and 3b, Case 5:** A.P. and lateral cervical roentgenograms showing bilateral upper mediastinal emphysema following instrumental removal of bone fragments from upper esophagus. Trapped air in retropharyngeal space is best demonstrated on lateral projection.
several small bone particles were seen and extracted. The procedure required 27 minutes. Within 10 hours it was noted that the neck was visibly swollen, crepitus could be palpated along either sternomastoid muscle and the temperature was 101 degrees F. An x-ray film taken at this time showed evidence of cervical emphysema (Figure 3) and he was given 100,000 units of penicillin every three hours, as well as intravenous fluids and saline throat irrigations. This routine was followed for five days at which time the symptoms subsided and on April 30, 1947 he was discharged without complaint and was on a regulation diet.

Case 6: D.M., choked on a small chicken bone four days prior to admission to the hospital. He was seen shortly thereafter by his family physician and a stomach tube was passed in an attempt to dislodge the foreign body which was felt to be in the upper esophagus. The patient continued to notice dysphagia and there was moderate pointed pain in the left cervical area but no palpable emphysema. These symptoms continued and on admission on August 23, 1947 he had a temperature of 100.8 degrees F. Esophagoscopy shortly following admission showed an edematous esophageal opening with gross evidence of mucosal trauma and immediately at the level of the cricopharyngeal region a small chicken done was observed. The foreign body was located in a transverse position directly across the esophageal lumen necessitating transection before removal in two separate pieces. The procedure required 45 minutes operating time and the patient ran a stormy postoperative course, the temperature reaching 104.6 degrees F. five hours later. Every three hours, 100,000 units of penicillin were given, intravenous fluids were administered, but nothing by mouth was ordered. Barium swallow taken four days later showed a pool of the opaque dyes outside of the esophageal lumen obviously at the previous site of the chicken bone (Figure 4). The temperature subsided to normal six days following esophagoscopy and

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**FIGURE 4a**

**FIGURE 4b**

*Figure 4a and 4b, Case 6: Oblique chest roentgenograms taken three days following esophagoscopy removal of transversely impacted chicken bone. Note pooling of barium at site of esophageal perforation.*
the patient remained asymptomatic. He was esophagoscoped one month later when the entire esophagus appeared normal and there was no evidence of perforation either by direct inspection or pooling of swallowed barium.

Case 7: C.M., aged 71, was esophagoscoped in investigation of a lower esophageal lesion which proved to be of a granulomatous nature. The procedure performed under local anesthesia on April 5, 1947 was done with some difficulty and as the instrument was advanced the patient turned himself on the table in an effort to remove the esophagoscope. A definite mid-esophageal perforation was at once recognized because of the appearance of the right lung through the lumen of the examining instrument. A Levine tube was immediately inserted into the stomach, penicillin therapy instituted and an x-ray film taken the same day showed a 25 per cent right pneumothorax confirming the operator's impression of pleural entry. Liquid diet was started 72 hours later and he made an uneventful recovery.

Case 8: S.D., aged 46, was esophagoscoped two days following the swallowing of a fragment of pork chop bone. He was admitted to the hospital on March 15, 1946 because of inability to swallow and under general anesthesia 10-15 grams of undigested meat with bone fragments were removed from the lower esophagus. The operative procedure required 55 minutes and there was gross evidence of maceration of the lower esophagus but no obvious perforation. On the following day, 18 hours after esophagoscopy the temperature rose to 102 degrees F. There were 24,800 white blood cells and cervical subcutaneous emphysema was palpable. X-ray films verified the emphysema and showed evidence of pneumonitis in the right lung field. Every three hours 50,000 units of penicillin were given. Intravenous feedings were administered and all diet was
discontinued. The temperature subsided within three days, liquids were then started by mouth and he was discharged six days later on a regular diet and was asymptomatic.

Case 9: E.G., aged 66, a diabetic female was admitted to the hospital because of progressively increasing dysphagia. Barium studies showed a stenosis of the lower esophagus and on December 8, 1947 esophagoscopy was performed. A fibrotic stenosis was observed and dilatation performed. Perforation was suspected and the procedure required 25 minutes. She was placed on heavy doses of penicillin and supportive therapy, but continued to run a septic course. Three weeks later a rib resection drainage of a left empyema was performed. Within a week her swallowing improved and she was discharged from the hospital on January 18, 1948 with empyema drainage still present. She continued to drain purulent material and finally succumbed three months later presumably of chronic suppuration.

Case 10: J.J., aged 72, has been under the care of a competent endoscopist for 20 years during which time frequent esophageal dilatations had been performed for an esophageal stricture of unknown etiology. In that interval he had been dilated about 35 times without incident. He was first seen by us on June 13, 1950, five days following a routine dilatation, with chest pain, temperature of 102 degrees F. and considerable epigastric discomfort. An x-ray film taken June 13, 1950 revealed a mediastinal fluid collection (Figure 5). A right posterior extrapleural mediastinotomy with resection of the ninth and 10th ribs was performed on June 14, 1950 and a putrid abscess was drained. Three weeks later a right empyema was likewise drained. He gradually fully recovered and complete healing occurred within a three month period. Penicillin therapy was administered during his hospital stay of six weeks.

Case 11: A.R., aged 50, was first seen by us on July 2, 1948 when she was admitted to the hospital via ambulance. According to history she

Figure 6, Case 11: Chest roentgenogram taken 21 days following endoscopic perforation of lower esophagus demonstrating complete collapse of right lung with pyopneumothorax.—Figure 7, Case 11: Film taken 13 days following right pulmonary decortication with pressure closure of esophago-pleural endoscopic perforation.
had been esophagoscoped for cardiopasm on June 14, 1948. Signs of lower esophageal perforation became manifest 12 hours later. Large doses of penicillin and streptomycin were administered, mouth feedings were withheld and rib resection drainage of a right empyema was performed four days following perforation. The drainage tube was removed two days prior to this admission when a phlegmon of the right posterior chest wall was present. X-ray film on this admission showed evidence of fluid which proved to be empyema with almost total collapse of the right lung. Any attempt at swallowing resulted in the immediate appearance of the swallowed material on the chest dressing. A Levine tube was inserted and she was maintained entirely on intravenous feedings. Penicillin was given in large quantities and on July 5, 1948 suction drainage of the empyema succeeded in removing all of the fluid but the underlying lung failed to expand (Figure 6). Any attempts at swallowing food again resulted in its appearance in the chest drainage bottle. On July 15, 1948 right thoracotomy was performed, the right lung was completely decorticated and no actual esophageal perforation could be demonstrated. The lung expanded readily and brought about pressure sealing of the esophageal opening (Figure 7). Five days later the Levine tube was removed. She was started on a liquid diet and in two weeks was discharged fully recovered. The final x-ray film taken on July 28, 1948 showed complete re-expansion of the lung.

Case 12: H.D., aged 55, experienced severe epigastric pain immediately following an emesis of large amounts of food and alcoholic beverages. This episode occurred during the early morning hours and he was immediately seen by a physician. He was in shock, and the severe mid-epigastric pain was not influenced by one-half grain of morphine. He was admitted to the hospital where x-ray investigation of the esophagus with lipiodol swallow justified the diagnosis of lower postemetic esophageal perforation. His condition rapidly deteriorated even during the time required for x-ray study. The pain increased in severity and he developed the nasal tone of voice so typical of mediastinal pressure. The blood pressure dropped to 80/40. Following administration of 600 cc. of plasma a left thoracotomy was performed. On opening the left side of the chest a sympathetic pleural effusion of approximately 500 cc. was encountered. Displacement of the lung uncovered a blackened mediastinal pleura from the diaphragm to the aortic arch. The pleura was incised and a two and one-half inch esophageal perforation running in a longitudinal direction one inch above the diaphragm was seen. The esophagus was closed directly with fine silk interrupted sutures and the chest was closed after water seal drainage of the pleura. A Levine tube was left in place for three days and the chest drainage tube was removed on the third post-operative day. He was discharged without complaint on January 3, 1949, 15 days following thoracotomy.

Case 13: H.K., aged 42, had always complained of a "weak stomach" and claimed that he vomited very easily. On June 2, 1949 closely after imbibing a large quantity of alcoholic beverage and food he had an unusually severe attack of vomiting followed at once by an emesis of about one-half cupful of blood and severe mid epigastric and lower chest pain. He was immediately seen by his family physician and the chest pain and prostration were of such an extent that he was immediately hospitalized. Chest x-ray films showed evidence of left pleural effusion,
air and fluid in the mediastinum and emphysema of the soft tissues of the neck. A diagnosis of ruptured esophagus was made on the basis of the plain x-ray film, and lipiodol swallow showing the opaque material free in the mediastinum confirmed this impression. He showed evidence of mild shock. His temperature was 97 degrees F., and the white cell count was 17,950. There were definite rales at the left lung base and palpable emphysema in the neck. Seven hours following the onset of symptoms left thoracotomy was performed. On opening the chest, stomach contents were free in the pleural cavity and there was a ragged two inch longitudinal tear in the esophagus just above the diaphragm. With each respiratory movement of the diaphragm, stomach content was regurgitated through the esophageal rupture. A suction tip was passed into the stomach via the esophageal rupture and much of the partially digested material was removed. The pleural cavity was thoroughly irrigated with saline solution, the esophageal rent was closed with interrupted fine silk sutures, the pleura was drained and the chest closed. Recovery was complicated only by severe penicillin dermatitis, and he was discharged from the hospital 14 days later on a regular diet and without complaints.

Case 14: G.B., a 68 year old female choked on a large chicken bone on March 11, 1951. She called her regular physician who administered a sedative hypodermically. She did not obtain relief to any degree and on March 14, 1951 became worse with fever and epigastric pain. She was admitted to the hospital and barium swallow demonstrated a foreign body in the lower part of the esophagus which had perforated the esophageal wall (Figure 8). Esophagoscopy was immediately performed and at the cardiac end of the esophagus an edematous, traumatized mucosa was

![Figure 8a](http://journal.publications.chestnet.org/pdfaccess.ashx?url=/data/journals/chest/21226/)

![Figure 8b](http://journal.publications.chestnet.org/pdfaccess.ashx?url=/data/journals/chest/21226/)

*Figure 8, Case 14: (a) Barium-filled esophagus showing chicken bone penetrating esophageal wall above diaphragm.—(b) Esophagram taken two weeks following removal of chicken bone.*
seen. The large chicken bone, two and one-half inches in length, was grasped and maneuvered free of its attachments to the esophageal wall. Mouth feedings were discontinued, penicillin, aureomycin and intravenous therapy were administered and she made an uneventful recovery being discharged on a full diet six days later.

Case 15: E.W., aged 52, was first seen 14 hours following abdominal repair of a hiatal hernia. She was in extreme shock, was dyspneic and there were absent breath sounds over the entire left chest. Needle aspiration of the left pleural cavity disclosed what appeared to be stomach content and closed intercostal drainage brought about immediate clinical improvement. A large esophageal perforation was demonstrated by the immediate appearance of ingested food in the chest drainage bottle. A Levine tube was inserted, Wangensteen suction instituted, intravenous fluids and heavy doses of penicillin were given. X-ray films showed evidence of hydropneumothorax on the left side with 50 per cent collapse of the lung. On September 30, 1948, 14 days following the insertion of the intercostal tube left thoracotomy disclosed a collapsed left lung covered with a heavy exudative peel and a two and one-half inch perforation in the esophagus just above the diaphragm. The esophagus was closed with several interrupted catgut sutures, the lung was decorticated and suction drainage of the pleural cavity established. Wangensteen suction of the stomach was carried out postoperatively; however, evidence of continued esophageal leak prompted a gastrostomy on October 18, 1948. The gastrostomy was allowed to function until December 1, 1948 when all chest drainage had ceased and she was returned to a regular diet. No further surgery was required and final check-up one year later was entirely satisfactory.

Case 16: M.L., aged 58, presented himself with history of cardiospasm of one year's duration. This diagnosis was confirmed by x-ray studies and esophagoscopy was entirely within normal limits. The symptoms persisted in spite of medical therapy and in view of this man's progressive weight loss, dilatations were felt in order. Under local anesthesia and with fluoroscopic guidance a Plummer-Vinson dilator bag was inserted and moderate pressure was exerted with the bag at the esophagogastric junction. He did not complain until four or five hours later, when he reported mild epigastric discomfort. The following day the pain became more severe, temperature was elevated to 100 degrees F. and barium swallow showed a rupture of the lower esophagus with barium in the peritoneal cavity. Laparotomy was performed on February 15, 1950, 36 hours following dilatation and a small tear at the esophagogastric junction was repaired. His recovery was complicated by a subphrenic abscess which was subsequently drained.

Discussion

Of the 16 cases of esophageal perforation presented in this series, 11 can be attributed to direct trauma caused by an endoscopic procedure. Because of the importance of prompt recognition and adequate treatment of instrumental esophageal rupture, particular attention shall be given to the 11 such cases in this series, six of whom had cervical perforations and the remaining five evidence of lower esophageal penetration.
Endoscopic Perforations of Cervical Esophagus:

In the consideration of the six cases of cervical perforation it is of remarkable interest to note that four cases were esophagoscoped because of investigative procedures involving the lower one-third of the esophagus, while the remaining two cases had definite penetrating foreign bodies in the cricopharyngeal region. The technical procedure performed in each of the six cases was carried out with ease insofar as the introduction of the instrument was concerned so that direct penetration of the esophageal wall with the tip of the esophagoscope was not considered likely. A careful review of the operative report in the four investigative esophagoscopies shows that the total time consumed during each procedure averaged well over 35 minutes. All four perforations occurred directly over the region of the sixth and seventh cervical vertebrae and each showed a linear tear approximately one and one-half cm. in length. It would, therefore, seem reasonable to assume that perforation in these four cases was brought about by prolonged pressure of the body of the esophagoscope resting on the prominent surfaces of the sixth and seventh cervical vertebrae. Each of the four cases were surgically treated by cervical mediastinotomy. In two, the esophageal tear was closed primarily and the third responded to simple drainage while the fourth case of this group was drained after 96 hours and succumbed shortly thereafter.

From these results it seems logical to assume that all instrumental cervical perforations of the esophagus should be treated by primary cervical mediastinotomy and closure of the rent as soon as the diagnosis can be made. This is reasonable from our results as the fatality in our group resulted from too long an interval between recognized perforation and corrective surgery. In these cases a matter of hours can be the difference between primary closure, drainage and failure. In case 1 surgical repair was accomplished in a clean field 25 hours following cervical esophageal rupture. In case 2, mediastinotomy was performed 41 hours following endoscopic perforation and closure was done in an already "musty" field. In case 3 performed 48 hours after rupture, frank purulent material was encountered making direct closure undesirable and hospitalization prolonged, while case 4 drained 96 hours following rupture proved to be too late for salvage.

In the other two cases of penetrating foreign bodies in the upper esophagus (Cases 5 and 6) it is admittedly possible that the introduction of the scope may have caused further penetration of the already embedded bony spicules. In both cases the fact of mediastinal invasion was definitely proved by x-ray and clinical signs, still supportive measures and antibiotic therapy were most effec-
tive without surgical intervention. Pressure of the esophagoscope on the already embedded bone spicules before removal was accomplished brought about a puncture mediastinal wound rather than a gross linear tear. It is probably because of the mediastinal pin point opening and lack of gross contamination plus antibiotic support that fatal sepsis did not occur.

Endoscopic Perforations of Lower Esophagus:

Of the five instrumental lower esophageal disruptions, two (Cases 7 and 8) healed with symptomatic and supportive treatment, the third (Case 9) required drainage of a left empyema and finally succumbed as a result of chronic suppuration and the remaining two cases (Cases 10 and 11) recovered following late reparative surgical procedures.

The two symptomatically treated cases were similar in the respect that retching and gagging were prominent reactions in both during the distal advancement of the esophagoscope. Case 7 was a diagnostic procedure for a lower esophageal lesion, which was performed under local anesthesia. The patient rolled himself on the table during the advancement of the instrument, and the immediate suspicion of lower perforation was confirmed by x-ray demonstration of right pneumothorax.

Case 8 was esophagoscoped because of a food bolus in the lower esophagus. The procedure was done with difficulty because of straining and retching during anesthesia and mediastinal penetration was probably caused by undue pressure with the tip of the instrument on an already macerated esophageal mucosa. The explanation of the probable etiology in these patients is much easier than the reasons for their recovery. These individuals were seen early in this series and fortunately responded to heroic conservatism.

The third case in this group (Case 9), a severe diabetic, was examined endoscopically for a fibrosing stricture of the lower esophagus. The stricture was dilated, and perforation of the lower one-third of the esophagus was suspected. Treatment was not instituted until three weeks later when a left empyema was drained and her general condition particularly with respect to diabetes made further corrective surgical therapy advisable.

The remaining two cases (Cases 10 and 11) of this lower instrumental perforation group represent dire situations resulting from delayed treatment. Case 10 demonstrates the ever present danger in repeated dilatations of chronic strictures even under direct vision. This elderly male had many previous dilatations of an old stricture of unknown etiology. A mediastinal abscess was drained six days following visual endoscopic dilatations. Eventual
recovery followed the subsequent drainage of an associated right empyema. Case 11 represents instrumental perforation in a relatively young individual with a normal esophagus. This 50 year old female was esophagosced for cardiospasm and developed immediate signs of lower perforation with right pleural involvement. She was seen by us three weeks following the incident with an esophageal pleural cutaneous fistula present in addition to an accompanying right empyema and collapsed lung. Complete recovery followed primary drainage of the right empyema, right thoracotomy and pressure closure of the fistula by re-expansion of the decorticated right lung.

In retrospect with these five cases in mind, judgment in the control of the first four seemed sound in consideration of the results obtained. The symptomatic therapy in the first two was most productive although I am sure that in light of our present concept of this complication, if similar cases of lower esophageal instrumental perforation were seen at this time thoracotomy with primary closure would be carried out. The elderly diabetic patient who was dilated and eventually had left empyema would undoubtedly not have withstood operative intervention of any kind. As regards Case 10, because of the extreme difficulty and likely impossibility of identifying the perforation in the scarred esophagus careful waiting for the development of the abscess in this 72 year old man was probably wise. In contradistinction, however, it would appear more reasonable in Case 11 where perforation resulted from an examination of a normal esophagus for cardiospasm in a relatively young individual, to institute primary closure at once before the complications of empyema, collapsed lung and fistula developed.

Non-Endoscopic Perforations of Lower Esophagus:

There were five cases in our series of non-endoscopic perforations and all seem worthy of mention both from an etiologic and therapeutic standpoint. Two cases of postemic spontaneous rupture of the lower esophagus have been reported elsewhere by my associate, Dr. Paul C. Samzon⁴ and both had uneventful courses following prompt and early left thoracotomy with closure (Cases 12 and 13). A recent one (Case 14) with a penetrating foreign body in the lower esophagus responded nicely following endoscopic removal, antibiotics and administration of parenteral fluids for three days. The fourth in this group (Case 15) whose perforation was caused during the abdominal repair of a hiatal hernia recovered after a complicated and stormy course including drainage, left pulmonary decortication, late closure of the esophageal tear and interval gastrostomy. The final case of lower esophageal
rupture (Case 16) resulted from dilatation with a Plummer-Vinson bag and recovered also after a stormy course requiring closure of the opening via the abdomen and secondary drainage of a subphrenic abscess. In this latter case barium was mistakenly used as a contrast medium in the suspected esophageal perforation. In such cases where a complication of this nature is suspected, less irritating lipiodol is much to be preferred for x-ray studies.

Conclusions

Endoscopic removal of sharp bone spicules at the cricopharyngeal level may bring about pin point mediastinal penetrations because of pressure of the tip of the esophagoscope before the particles are removed. Such “stab” wounds of the mediastinum may be treated symptomatically with relative safety providing progressive clinical improvement is observed.

Prolonged operative time consumed in endoscopic procedures involving the lower esophagus may cause tears in the cervical area because of pressure of the body of the instrument over the prominent cervical vertebrae. These linear tears of the cervical esophagus should be repaired surgically as soon as the diagnosis is made.

Lower esophageal perforations due to instrumentation should be treated by thoracotomy and primary closure unless extreme debility or sclerosing luminar lesions make the surgical approach impractical. Postemetic or so-called spontaneous rupture of the esophagus while a relatively rare lesion, can be diagnosed both by clinical and radiological signs and early thoracotomy with primary esophagus closure is the most effective treatment.

A non-irritating contrast medium should be used for esophageal x-ray visualization when perforation is suspected.

SUMMARY

A series of 16 cases of esophageal perforations treated in the past four years is presented. Eleven of this group had perforations directly due to endoscopic procedures, while the remaining five cases were precipitated by other causes.

The treatment of each case is outlined, a discussion of the probable etiology is given and recommendations are made for future handling of similar cases.

RESUMEN

Se presenta una serie de 16 casos de perforación del esófago, tratadas en los últimos cuatro años. Once de este grupo tenían perforaciones debidas directamente a procedimientos endoscópicos, mientras que los cinco casos restantes eran debidos a otras causas.
El tratamiento que en cada caso es descrito, discute la probable etiología, y se hacen recomendaciones para el manejo de casos similares.

RESUME

L'auteur rapporte seize observations de perforations oeso-phageennes traitées dans les quatre dernières années. Onze de ces cas avaient pour cause des manoeuvres endoscopiques, d'autres étiologies devaient être invoquées dans les cinq derniers cas.

L'auteur détermine le traitement de chaque cas, envisage l'étiologie probable et établit quelques règles pour la conduite à tenir dans d'éventuelles observations similaires.

REFERENCES