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Klinik Çalışma

Management of late cervical esophageal perforation

Geç servikal özofajiyal perforasyonun tedavisi

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BACKGROUND
We aimed to identify different methods of treating late perforation of the cervical esophagus.

METHODS
Ten late cervical esophageal perforations were caused by foreign bodies. The subjects were divided into three groups according to their diagnosis and treatment as follows: Group I: Cases with cervical abscess were drained by lateral cervical incision and primarily repaired, Group II: Cases with cervical abscess were drained by lateral cervical incision, and any foreign body granulomas found were removed, and Group III: Foreign bodies were removed. All cases were given broad-spectrum antibiotics and were prohibited from any oral food, except Case 5.

RESULTS
All patients recovered without mortality and retained normal swallow function. The time for treatment in each group was different.

CONCLUSION
The conservative management of removal of foreign body, prohibition of oral food and administration of broad-spectrum antibiotics is supported. Perforations with the presence of abscess can be surgically treated by debridement closure combined with strip muscle flap repair and irrigation drainage. Granuloma can be removed by lateral cervical incision and vacuum sealing drainage.

Key Words: Esophageal perforation; late cervical management; primary repair.

AMAÇ
Servikal özofagusun geç perforasyonu tedavisine yönelik farklı yöntemler belirlemeyi amaçladık.

GEREÇ VE YÖNTEM
Yabancı cisim nedenli 10 adet geç servikal özofajiyal perforasyon olgusu incelendi. Olgular, tanılarına ve tedavilerine göre üç gruba bölündü. Grup I: Servikal apseli olgular; bu hastalar daha sonra servikal insizyonla drene edildi ve primer olarak tamir edildi, Grup II: Servikal apseli olgular; bu hastalar daha sonra servikal insizyonla drene edildi ve yabancı cisim granülomu olan apseler çıkartıldı ve Grup III. Yabancı cisimler çıkartıldı. Bütün olgulara geniş spektrumlu antibiyotikler verildi ve oral yolla herhangi bir gıda almaları bir hasta dışında kısıtlandı.

BULGULAR
Bütün hastalar mortalite gerçekleşmeksizin düzeldi ve normal yutma fonksiyonu korundu. Her gruptaki tedavi zamanı farklı idi.

SONUÇ
Yabancı cismin çıkartılmasında, oral yolla gıda alımının yasaklanması ve geniş spektrumlu antibiyotikler verilmesini içeren konservatif tedavi uygundur. Apse ile birlikte olan perforasyonlar, strip kas flep tamiri ve irrigasyon drenajı ile bir arada uygulanan debridman yoluyla cerrahi olarak tedavi edilebilir. Granüloma daha sonra servikal insizyon ve vakum drenaj ile çıkartılabilir.

Anahtar Sözcükler: Özofajiyal perforasyon; geç servikal tedavi; primer tamir.

Esophageal perforation is a rare condition in otolaryngology practice. Due to its serious complications, prompt diagnosis and appropriate treatment are vital.[1,2] Despite the recent advances in the diagnosis and treatment, esophageal perforation is associated with high morbidity and mortality. The optimal approach to esophageal perforation remains problematical and controversial.[3,4]

Esophageal perforation can be divided into two types by the time interval from the perforation to its diagnosis and treatment. Early type is defined as diagnosis made in less than 24 hours, whereas late type is diagnosis after more than 24 hours.[4,5] Many authors have suggested that early type could be managed by repair of the perforation and drainage of the contaminated area.[4,6,7] In a delayed diagnosis of esophageal

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perforation, despite the high morbidity and mortality, either exclusion-diversion or conservative treatment was recommended.[6-8] In esophageal perforation with delayed treatment, mortality was 27% (0%-46%) if diagnosed in 24 hours or more compared to 14% (0%-28%) if diagnosed in less than 24 hours.[4]

We present herein the results of the management of 10 late cervical esophageal perforations, with either conservative or surgical therapy, which included primary repair of the perforation by reinforcement with cervical strip muscle. Our aim was to identify different means of treatment in perforation of the esophagus and to evaluate their clinical outcomes.

MATERIALS AND METHODS

A retrospective study of 10 late cervical esophageal perforations due to foreign body was performed. All patients were treated at the Second Affiliated Hospital of Zhejiang University School of Medicine, from April 1994 to April 2008. The study was approved by the Ethics Committee of the 2nd Affiliated Hospital of the Medical School.

The sample included 2 male and 8 female patients, with a mean age of 48.6 ± 17.9 years (range: 5-71 years). Diagnosis of esophageal perforation was delayed more than two days. Their perforations were caused by foreign body: fish bone (7), piece of glass (1), chicken bone (1), and window ring (1) (Table 1). Those patients were divided into Group III and other (Group I and Group II with/without primary repair) according to the cervical abscess and/or granuloma. In term of clinical features, they all had odynophagia and leukocytosis. Some had fever, dysphagia, subcutaneous or mediastinal emphysema, neck abscess, and foreign body granuloma due to migration of the fish bone through the esophagus wall into the lateral neck.

Group I- Two cases with cervical abscess were drained by lateral cervical incision and primarily repaired, and the site of perforation was located by esophagoscopy during the operation. Then, the perforation was closed with absorbable suture (3.0 Vicryl), and reinforced with cervical strip muscle. Furthermore, irrigation drainage was used in Case 1, with double drain tubes. Only vacuum sealing drainage was applied in Case 2, with one drain tube. 0.5% povidone-iodine and antibiotic solution irrigation were used to clear the abscess cavity daily after the operation, though it was impossible in patients with vacuum sealing drainage.

Group II- Unfortunately, although the foreign body was extracted in a local hospital, a large perforation was neglected in Case 3 (Fig. 1). Cases 3 and 4 with cervical abscess were managed with irrigation drainage after lateral cervical incision, without primary repair. Foreign body granuloma was removed by lateral cervical incision in Case 5 (Fig. 2). Therapy

Table 1. Treatment and clinical characteristics of late cervical esophageal perforation

	Case	Sex/ Age	Time †	Foreign body	Rigid esophagoscopy and its result in local hospital		Abscess/ Granulation	Management	Fever	Subcutaneous or Mediastinal emphysema	Time of cure
					Operation	*Result*					
I	1	F/58	10 d	Fish bone 4.0x0.4 cm	Yes	Not found	Abscess	Rigid esophagoscopy Primary repair Irrigation drainage	Yes	Yes	12 ds
	2	M/71	7 d	Fish bone 3.0x0.2 cm	No	FB vomited	Abscess	Rigid esophagoscopy Primary repair Vacuum drainage	Yes	No	50 ds
II	3	F/56	7 d	Fish bone 4.0x1.5 cm	Yes	Extracted	Abscess	Irrigation drainage	Yes	Yes	40 ds
	4 ‡	F/37	3 d	Piece of glass	No	–	Abscess	Rigid esophagoscopy Vacuum drainage	Yes	Yes	24 ds
	5	M/52	10 d	Fish bone 3.0x0.3 cm	No	–	Granulation	Rigid esophagoscopy Vacuum drainage Granuloma removal	No	No	7 ds
	6	F/51	4 d	Fish bone 1.5x0.2 cm	No	–	Small abscess granulation	Rigid esophagoscopy Vacuum drainage Granuloma removal	Mild	No	14 ds
III	7	F/37	3 d	Chicken bone 3.5x1.5 cm	Yes	Not extracted	No	Rigid esophagoscopy	No	Yes	11 ds
	8	F/5	3 d	Window ring (2 cm)	Yes	Not extracted	No	Rigid esophagoscopy	No	Yes	10 ds
	9	F/67	3 d	Fish bone 3.5x0.2 cm	Yes	Not found	No	Rigid esophagoscopy	Mild	Yes	11 ds
	10	F/52	2 d	Fish bone 3.0x0.2 cm	Yes	Not found	No	Rigid esophagoscopy	No	Yes	9 ds

d: Day; † Time indicates time interval from presenting symptom (pain, dysphagia, emphysema and leukocytosis, etc.) to management in our hospital.
‡ Rigid esophagoscopy was performed in our hospital to extract pieces of glass, and abscess was formed in three days.

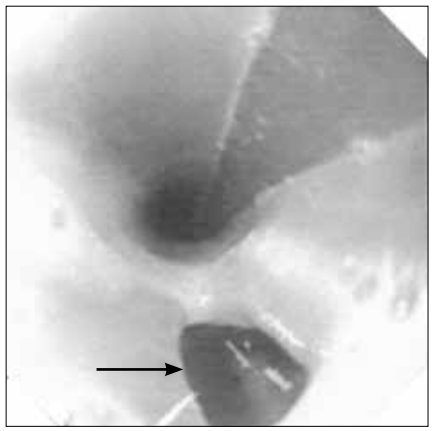

Fig. 1. The arrow indicates a perforation of the esophagus (2.0×3.0 cm).

of Case 6 with foreign body granuloma and small abscess (0.7×1.5 cm), which was shown by ultrasonography, was similar to that of Case 5. Vacuum sealing drainage was used in both.

Group III- Four cases without abscess and granuloma were managed by rigid esophagoscopy, then foreign bodies were taken out and cervical esophageal perforation was confirmed.

Standard postoperative care was provided with administration of broad-spectrum antibiotic, and patients were kept nil by mouth, with a nasogastric tube (except Case 5). Adequacy of recovery was confirmed by a 76% gastrograph in all cases.

RESULTS

All patients recovered without any morbidity and retained normal swallow function during follow-up. In Group I, recovery time was 12 days in Case 1 and 50 days in Case 2. Because esophageal fistula emerged on day 9, it was closed by daily redressing. Recovery time in Group II patients was 40 days, 24 days, 7 days and 14 days, and in Group III patients, was 11 days, 10 days, 11 days and 9 days.

DISCUSSION

Compared to other esophageal diseases, esophageal perforation is a rare condition that can be difficult to diagnose and manage due to lack of experience.[6] Esophageal perforation can occur due to sharp or pointed foreign body ingestion.[9] Kay[10] reported a perforation rate of 15%~35%. In 149 patients from five recent series,[1,5,9,11,12] we found that cervical esophageal perforations were associated with a mortality of 5.9% (0%-20%), whereas thoracic perforations were associated with a mortality of 10.4% (0%-36.8%).

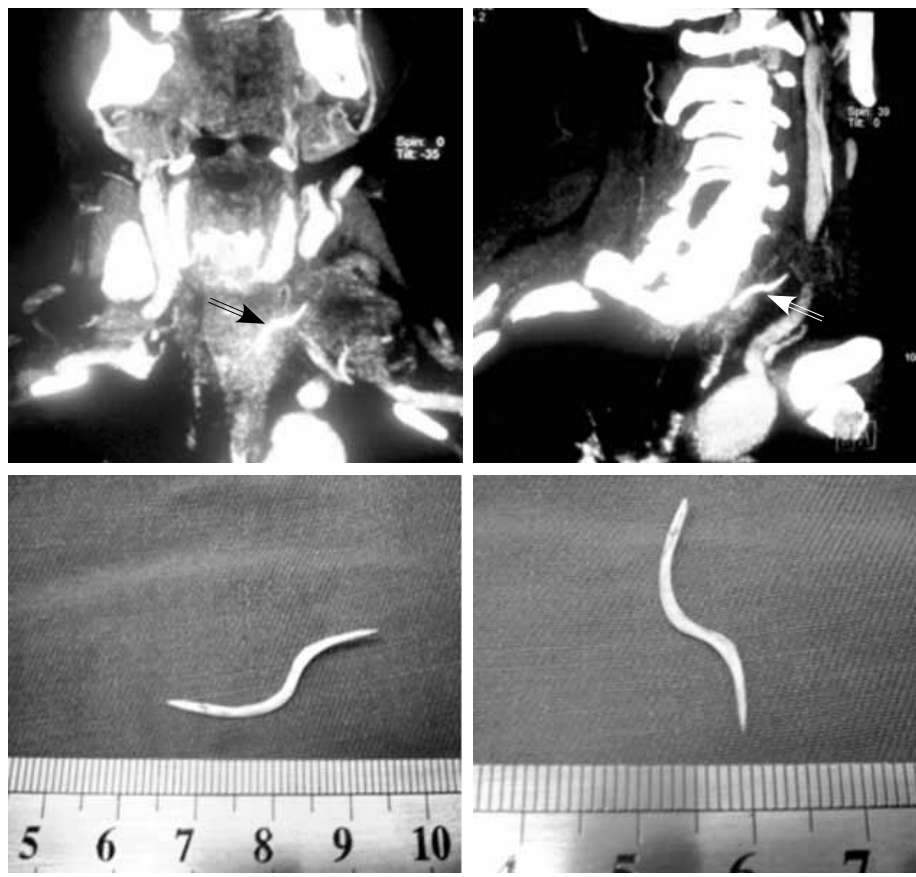

Fig 2. CT reveals granulation and fish bone in the base of the neck. The fish bone extracted during the operation is shown.

Breigeiron's research[13] showed the risk factors for surgical management of esophageal perforation were: age ≥50 years, time delay to treatment >24 h, and associated lesion in another cavity.

Management of esophageal perforation can be divided into conservative or surgical therapy. Conservative approach can be acceptable in selected patients with well-contained perforations and minimal cervical and mediastinal contamination.[3,4] In Group III, esophagoscopy and conservative treatment were used in all patients without cervical and mediastinal contamination. Because inflammation was local, cervical incision was not necessary. This concurs with the view of Wu,[3] who revealed that nonoperative management had a role in selected patients who had cervical esophageal perforation with minimum systemic signs. Lam[1] reviewed that conservative treatment was successful in seven perforation patients without abscess and in one patient with neck abscess who refused surgery. If conservative treatment in patients with cervical esophageal perforations is unsuccessful, computed tomography (CT) or ultrasonography should be performed to identify possible complications such as cervical and mediastinal abscess. If an abscess is found, surgical intervention should take place without delay.[2,4,5] For these delayed patients, the exploration and surgical drainage by cervical incision are usually recommended;[2,4,5,8,14] however, repair of the perforation was unnecessary.[3,4] Miller[15] reported that ultrasound-guided catheter ("pig-tail") drainage of abscesses was a feasible choice.

The presenting symptom, fever, pain, dysphagia, leukocytosis, and subcutaneous or mediastinal emphysema, should not occur in uncomplicated cases of ingested foreign bodies.[1,16] In our series of esophageal perforation, except for Case 5 who had mild local pain and odynophagia, the others had these symptoms. All cases of ingested foreign bodies should be under close observation in order to identify the complication of esophageal perforation, including persisting or aggravating pain, fever and leukocytosis. Pain that persists or worsens with time should be regarded as an early symptom of a serious complication.[1] The diagnosis of suspected esophageal perforation can also be made by retropharyngeal air, widening of retropharyngeal soft tissue, leakage of contrast, or an extraluminal foreign body.

By irrigation drainage of the abscess and primary reinforced repair of perforation, we found that the recovery time in Case 1 was less than in the other three cases (Case 1 to Case 4). Certainly, recovery time was correlated with the size of the perforation and local condition. Our experience showed that the technique might provide a real improvement for this precarious esophageal perforation with neck abscess. Why were the results in Group different? It might be that single tube drainage was not enough to minimize wound contamination, especially in a patient with a serious complication, so that alleviating the swelling around the tissue of the esophageal perforation was slow and cure failed. Irrigation drainage was shown to be beneficial in alleviating the swollen tissue and resolving the esophageal perforation. Righini[16] reported one successful case with abscess: the impacted foreign body was successfully extracted under rigid esophagoscopy, and direct suture was required to close the esophageal perforation. Although the technique of reinforcement with cervical strip muscle was not used, this strong multi-tubular silicone drainage rapidly minimized contamination and was sufficient to cure the perforation. In addition, therapy should include administration of broad-spectrum antibiotics and total parenteral nutrition or adequate nutrition through nasogastric tube.

Cases 5 and 6 were successfully treated by removing the granuloma with a lateral cervical incision. We believe that foreign body granuloma should be removed and the operation area should be drained; primary repair was not necessary because the perforation had almost resolved and inflammation was local. Relief of pain and fever and normal leukocytosis suggest perforation recovery. Water-soluble contrast agents were used to detect the perforation condition. If the result was negative, oral feeding was resumed.

In conclusion, on the basis of these data, delayed esophageal perforations with existence of abscess can be successfully treated by debridement closure combined with strip muscle flap and irrigation drainage. Granuloma can be removed by lateral cervical incision and vacuum sealing drainage. We support the management of removal of foreign body, administration of broad-spectrum antibiotics and no oral feeding.

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