



Case Report

A Case of Corrosive Esophagitis in Lao People's Democratic Republic

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Introduction: Corrosive esophagitis is often caused by the intake of alkaline or acidic substances. Esophageal stenosis is the most important late complication of corrosive esophagitis. In Laos, where Western medical care is available in few locations, treatment for esophageal stenosis is challenging. We report on a patient who was treated in Laos.

Case Presentation: In Laos, an 18-year-old woman attempted to commit suicide by drinking an acidic detergent. Sixteen months later, she consulted a district hospital in Laos, which is supported by a Japanese nonprofit organization, with a chief complaint of dysphagia. An upper gastrointestinal series demonstrated severe stenosis of her thoracic esophagus. She underwent open laparotomy for gastrostomy with a urinary catheter to improve her nutritionally poor condition; the operation was performed by a Japanese surgeon with Lao medical staff. Through the gastrostomy, she injected liquid food by herself. Gradually she became unable even to drink water. Because we could not obtain any devices for esophageal dilatation in Laos, balloon dilatation catheters were donated from Japan. Twenty-three months after the injury, the endoscopic balloon dilatation for esophageal stenosis was performed by a Japanese physician, who also taught local physicians how to use the device. The patient's esophagus was as narrow as a pinhole at 20

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cm from the incisors. Repeated balloon dilatation by local physicians enabled her to consume solid food orally.

Conclusion: Corrosive esophagitis combined with stenosis is often difficult to treat. The Lao patient was successfully treated by a combination of local and foreign medical staff.

Key words: Corrosive esophagitis – Esophageal stenosis – Suicide

Corrosive esophagitis is usually caused by the ingestion of caustic substances, such as detergents, dishwashing liquid, or drain cleaners (by accident or with suicidal intent). Esophageal stricture formation is an important problem in corrosive esophageal injuries.¹ We experienced a case of esophageal stricture formation in Lao People's Democratic Republic (Laos). The authors managed the patient in Laos with the cooperation of local and Japanese medical staff. Here, we report on this case.

Case Report

An 18-year-old woman with a chief complaint of dysphagia consulted a district hospital in the suburbs of Vientiane, Laos, in October 201X; the hospital is supported by Japan Heart, a Japanese nonprofit organization. The woman had attempted to commit suicide by drinking toilet detergent in June 201X-1. The detergent contained 15% hydrochloric acid and 2% ethoxylated alcohol. She had had family problems. At the time of the consultation, she was able to drink small amounts but could not eat anything. Her body weight was 33 kg, and her height was 162 cm (body mass index = 12.6). An upper gastrointestinal series demonstrated severe stenosis of her thoracic esophagus (Fig. 1). Her psychologic condition was stable, and she no longer wanted to commit suicide.

In October 201X, she underwent open laparotomy for gastrostomy using an 18-Fr urinary catheter at the district hospital; the procedure was performed by a Japanese surgeon in cooperation with Lao and Japanese medical staff. The injection of Racol (Otsuka Pharmaceutical Factory Inc, Naruto, Japan), a well-balanced liquid diet, which was donated from Japan, into the gastrostomy tube, was started on the fifth postoperative day. On the 15th postoperative day, the Racol was replaced with liquid food made of vegetable chicken soup and rice porridge.

After being educated about how to care for her gastrostoma, the patient was discharged on the 35th postoperative day. Her body weight was 37 kg around that time. After being discharged, she

injected liquid food, including eggs, tofu (soybean curd), chicken soup, soy milk, and a chocolatey malt drink, through the gastrostomy tube by herself.

As she became unable even to drink water, endoscopic balloon dilatation for esophageal stenosis was planned. Standard endoscopic devices were available at some of the big hospitals in Vientiane; however, the hospitals had no experience with balloon dilatation and did not have any of the required devices. After obtaining approval for their use from the Lao government, CRE wire-guided esophageal/pyloric balloon dilatation catheters



Fig. 1 An upper gastrointestinal series demonstrated narrowing of the upper thoracic esophagus.

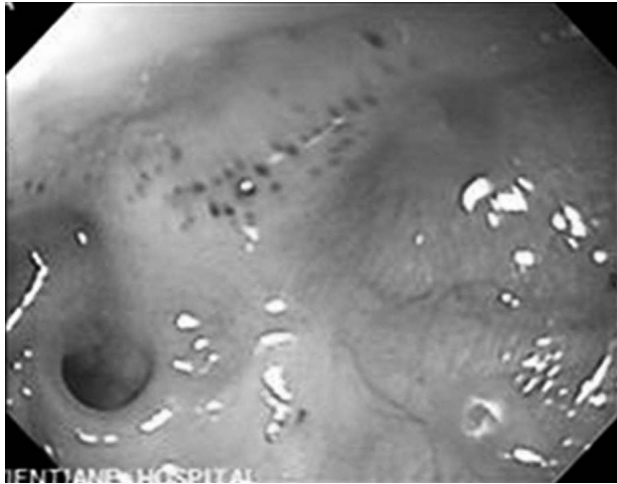


Fig. 2 Esophagogastroduodenoscopy showed a pinhole located 20 cm from the incisors.

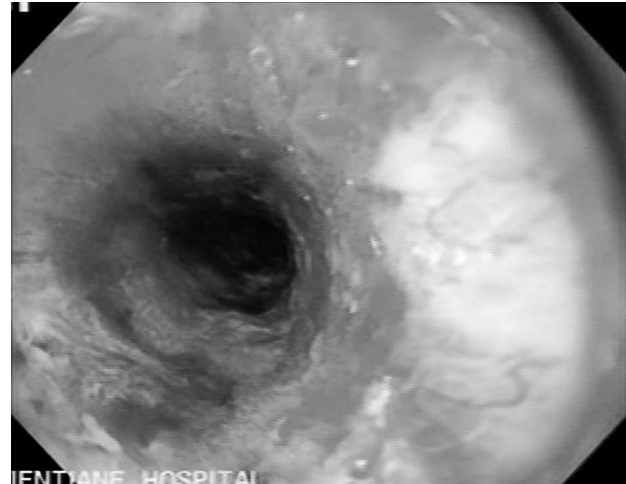


Fig. 3 After the fifth endoscopic balloon dilatation, the esophageal lumen was dilated to 13.5 mm.

were donated by Boston Scientific (Marlborough, Massachusetts). The endoscopic balloon dilatation was performed by a Japanese physician, who also taught local physicians how to use the device, in a hospital in Vientiane in May 201X+1. The endoscopy revealed severe stricture formation of the esophagus, with re-epithelialized mucosa at 20 cm from the incisors (Fig. 2). Dilatation of the stricture to a diameter of 10 mm using a balloon of 10 to 12 mm in outer diameter and of 5.5 cm in length was carried out during the first procedure. Repeated treatments were performed by local physicians around once a week. The patient became able to eat solid food and finished using the gastrostoma after the third balloon dilatation procedure, which dilated the esophagus to 12 mm, and the endoscope could pass through the esophagus to the stomach after the fifth balloon dilatation, which dilated the esophagus to 13.5 mm using a balloon of 12 to 15 mm in outer diameter (Fig. 3). To maintain the esophageal lumen, balloon dilatation had been continued every 3 to 4 weeks. Her body weight increased to 54 kg by August 201X+1, after the seventh balloon dilatation. The gastrostomy tube was removed in October 201X+1.

Because this is a case report, ethics approval was not required.

Discussion

Corrosive esophagitis is a condition in which the esophagus is damaged by harmful substances, such

as alkaline or acidic substances. Acid induces coagulation necrosis with eschar formation.^{2,3} The pathologic classification of caustic injury to the esophagus is similar to classification of burns to the skin.⁴ A first-degree burn is characterized by hyperemia, edema, and superficial ulceration of mucosa. A second-degree burn is characterized by erythema, blister formation, and superficial ulceration with fibrinous exudate. A third-degree burn is characterized by loss of epithelium, deep ulceration, and evidence of granulation tissue. At 3 to 4 weeks after an esophageal injury, 84% to 95% of patients with third-degree burns and 15% to 30% of those with second-degree burns go to stricture formation as the collagen fibers begin to contract, whereas those with first-degree burns rarely develop stenosis.^{3,5-7} When healing with re-epithelialization is completed, usually by the sixth week, replacement of the defect by a dense fibrous coat results in an esophagus with pockets and channels, or possibly complete obliteration of the lumen.⁵ The contractile process continues during a period of months to years.^{7,8}

Matsumura *et al*¹ reviewed 31 cases of corrosive esophagitis that were treated in Japan. According to their report, 17 cases were caused by alkaline substances, and 13 cases were caused by acidic substances. Among the latter cases, 10 patients (77%) developed esophageal stenosis.

Balloon dilatation of the esophagus, which has become available in most institutions in Japan, should be the first-line treatment for esophageal

strictures, although it carries a risk of perforation. In Korean patients with corrosive esophageal strictures by acidic substances, endoscopic balloon dilatation resulted in a success rate of 88%, whereas the rupture rate of endoscopic balloon dilatation was 12% and the recurrence rate was 63%.⁹ In a Turkish report, the balloon dilatation was successful in 96% of the patients who developed esophageal strictures by hydrochloric acid.¹⁰ Because the natural course of severe, deep, and circumferential caustic esophageal burns is progressive, and the remodeling period is protracted (from 6 to 24 months), dysphagia can occur during this period, and long-term treatment is necessary.¹¹ Actually, our patient gradually became unable to eat 1 year after suffering the injury. The optimal frequency and timing of such procedures are not well established and are largely decided on an individual basis based on the effects of previous dilatation procedures and the patient's symptoms. Bittencourt *et al*¹² reported that the mean number of dilatation procedures required to treat esophageal strictures caused by corrosive substances was 13.7 ± 10.9 (range, 1–36). It is suggested that the following technical precautions might reduce the incidence of esophageal perforation during endoscopic balloon dilatation¹³: (1) the balloon diameter should be adjusted to the stricture's size, and the balloon size should be increased gradually; and (2) it is important to avoid increasing the dilatation of the esophageal lumen to its maximum diameter too quickly during a single procedure.

Esophagectomy can be selected in patients whose symptoms are not fully relieved even after repeated balloon dilatation procedures. According to the previously mentioned Japanese review,¹ 7 of 10 patients who developed esophageal stenosis after swallowing acidic substances underwent esophagectomy, whereas only 1 patient was treated using balloon dilatation alone. Because the incidence of esophageal cancer after corrosive esophagitis is said to be 1000 times higher than that seen among the general population,¹⁴ esophagectomy is recommended for patients who have corrosive esophagitis, especially young patients, in Japan. However, esophagectomy seems to be too invasive to be performed in Laos.

Laos is a landlocked country in Southeast Asia. There were 0.182 physicians per 1000 people in Laos in 2012, whereas the equivalent figure for Japan was 2.297 in 2010, which is 12.6 times higher than the number in Laos.¹⁵ In 2013, life expectancy at birth was 66 years in Laos, whereas it was 84

years in Japan. There are some big hospitals in central Vientiane (the capital of Laos) where modern treatments are performed, whereas traditional medicine is still popular in some rural areas. Although a lot of foreign support has already been provided to Laos, there are still many poor people who never receive medical treatment.

Japan Heart was founded in 2004 as a volunteer-based international health care organization. Medical professionals, particularly physicians and nurses, are sent from Japan Heart to engage in health care activities in Myanmar, Cambodia, and Laos. The organization started providing medical support at a district hospital in the suburbs of Vientiane in Laos in 2012. In the current case, the patient was told that there were no treatments for esophageal stenosis in Laos, and so she came all the way to the district hospital that Japan Heart supports. Gastrostomy was carried out successfully, but no enteral feeding formulas are available in Laos. Donated formula was injected at first, but after this had been used, a soft diet made of foods that are available in Laos, which was developed based on nutritional information by Japanese nurses, was injected, which sometimes caused catheter occlusion and necessitated catheter exchange.

The process for the endoscopic balloon dilatation was more complicated than usual because balloon catheters are not available in Laos. First, we needed to seek the approval from the Lao government to use catheters. Second, a Japanese company offered to donate catheters. Third, we had to search for a hospital that had the required endoscopic devices, which were not available at the district hospital. Thankfully, we found a hospital that was able to perform endoscopic treatment in central Vientiane. Fourth, a Japanese physician went to Laos with the catheters and then taught local physicians how to use them. Now, the local physicians can perform endoscopic balloon dilatation in cooperation with Japanese staff.

In conclusion, we experienced a case of corrosive esophagitis in Laos. As a result of cooperation between local and Japanese medical staff, the patient was treated successfully.

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