Case Report

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Nursing approach to Zenker's diverticulum surgery patient

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ABSTRACT

Zenker's diverticulum, which is herniation of pharyngeal mucosa, typically occurs in the elderly population with dysphagia, regurgitation, halitosis, and malnutrition. Here we report one case of Zenker's diverticulum and nursing care and diagnosis process. The patient complained of weight loss, halitosis and intermittent periods of cough. It was diagnosed that the patient had stage two Zenker's diverticulum on the upper part of esophagus and back to thyroid gland. The patient successfully underwent surgery and stayed five days in hospital. After the postoperative third day it was allowed the patient's oral feeding. After an uneventful recovery and adequate oral intake, the patient was discharged on the fifth postoperative day.

Keywords: Nursing care and diagnosis, Surgical treatment, Zenker's diverticulum

INTRODUCTION

Esophageal diverticulums are rare entities. According to the formations, they are called as real diverticulum and pseudodiverticulum. The real diverticulums contain all layers of the esophagus and are usually congenital lesions. Pseudodiverticulum consists of herniation of the mucosa and submucosa to muscular layer and are usually acquired lesions. According to the localization, esophageal diverticulum divided into three as faringoozofageal (Zenker's diverticulum), mid esophageal and distal esophageal diverticulum. In this study, we talked about the case of Zenker's diverticulum (ZD).

ZD was first described in 1769 by Abraham Ludlow with the identification of a large pouch on back wall of the pharynx in the autopsy of a patient suffering from dysphagia throughout the life. German pathologists (Zenker and Ziemssen) published a series of 27 patients in 1877 and identified to ZD as herniation of pharyngeal mucosa. $^{1-8}$

A rare case ZD caused the increase in intrapharyngeal pressure due to spasms of the upper esophageal sphincter. The increased pressure is most frequently attributed to incomplete relaxation of the upper esophageal sphincter causing a high pressure zone within the hypopharynx. Other abnormalities in upper esophageal sphincter function such as uncoordinated contraction and premature contraction and relaxation have also been postulated as potential causes of this increased pressure. 1,9-11 The incidence of ZD was estimated to be 1-2 per 100.000 patients/year and twice as common in males. Patients with ZD may complain of regurgitation, hoarseness, halitosis but the most common complaint in 80 to 90% of people is dysphagia. As the diverticulum progressively enlarges, symptoms may get worse leading to profound weight loss and malnutrition. Approximately 30 to 40% of these patients may also present with persistent cough

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and aspiration, with a few even having aspiration pneumonia. 12,13

Diagnosis of Zenker's Diverticulum

Esophageal barium swallow constitutes the most important diagnostic test. At the level of the sternoclavicular joint, typical outpouching on the dorsal surface of the esophagus is seen, and its size and position can be assessed. However, dynamic continuous fluoroscopy is preferred because it allows monitoring of the swallowing mechanism and may detect a small diverticulum during ingestion of water, an increase in the lesion's size, a reduction in the definition of the margins, and heterogeneous echogenicity of the lesion's contents are seen. Evaluation of the lower esophagus, stomach and duodenum may detect abnormalities such as hiatus hernia or reflux esophagitis. A non-progressive filling defect or loss of the smooth contour of the interior of the pouch should raise suspicion of a carcinoma. 1,14-17

Esophagogastroduodenoscopy is not necessary to confirm the diagnosis of ZD, but it serves to rule out malignancy in the pouch and to exclude other conditions responsible for the patient's symptoms, such as reflux esophagitis or tumors. ^{1,14}

Ultrasonography as a diagnostic modality for ZD may also be useful in elderly patients who cannot tolerate barium esophagography and in those with a neck mass on physical examination. ^{1,14}

Treatment of Zenker's Diverticulum

Standard treatment is excision of diverticulum and cricopharyngeal (CP) myotomy, including upper 3 cm of posterior esophageal wall. Surgical procedure is determined according to size of the diverticulum. If diverticulum is less than two centimeters, a CP myotomy alone is sufficient. If diverticulum is between three and six centimeters, endoscopic or open procedure must be used. When the diverticulum exceeds 6 cm, an open approach is generally considered a more favorable procedure. ^{13,17}

Surgical procedure

Cricopharyngeal myotomy

Endoscopic techniques: Endoscopic staple diverticulostomy, CO2 laser and electrocautery

External techniques: Cricopharyngeal myotomy with diverticulectomy and cricopharyngeal myotomy with diverticulopexy.¹³

Open surgery for Zenker's diverticulum: It is referred to treatment choice of ZD. Routinely, an open left cervical incision is usually performed under general anesthesia. The diverticulum is then freed and followed by

cricopharyngeal myotomy. Further, the diverticulum is either resected (diverticulectomy), or more conservatively, suspended and fixed on the hypopharyngeal wall (diverticulopexy) or invaginated into esophagus itself (diverticular inversion). ^{13,15}

Endoscopic diverticulotomy: It is described as esophagodiverticulotomy. But this procedure has a high risk of mediastinitis. But using electrocautery in endoscopic diverticulotomy is safer for mediastinitis. The endoscopic approach can commonly be consummate two ways as a flexible or a rigid endoscope.¹³

Rigid endoscopic diverticulotomy: It is carried out under general anesthesia and patients are placed supine with their neck overextended. A special diverticuloscope is used to visualize and expose the common septum separating the diverticular sac from the esophageal lumen. It is effective technique as open surgery and it has advantages like shorter hospital stay, rapidly resumption of oral intake. Division of the septum can be performed by one of the following techniques: electrocautery, CO2 laser, KTP/532 nm laser, stapler, needleknife or harmonic ace. ^{13,15,17}

Endoscopic electrocautery (Dohlman's technique): The electrocautery technique performs the classic method for endoscopic diverticulotomy.¹³

Endoscopic CO2 laser technique: It has a lot of advantages. As high energy, high focus beam, and less tissue trauma, rapid healing and mucosal coverage of cut surfaces. Also it provides a better visualization of the diverticular bridge and easier control of the operation.^{13,15}

Endoscopic stapling technique: In the last 10 years, endoscopic stapling technique has become increasingly popular. The technique is consequently not indicated for diverticula smaller than 3 cm. It acquires a lot of advantage as simultaneously cut and seal the wound edge, contributing to a lower incidence of perforation and bleeding. Besides this procedure doesn't thermal damage on laryngeal nerve. ^{13,15,18}

Endoscopic harmonic scalpel: The harmonic scalpel is used in laparoscopic surgery to simultaneously cut and coagulate tissues with minimal thermal spread to adjacent tissues. The harmonic scalpel blade operates ultrasonically, causing protein denaturation such that vessels are sealed and tamponaded while providing adequate and effective timely haemostasis. Also it is effective in diverticule smaller than two cm. 15

Flexible endoscopic diverticulotomy: It is safe and effective treatment. But the treatment option includes perforation risk. It has two major advantages over the rigid endoscopic approach. Using a variety of accessories (nasogastric tube, hood, endoscopic cap, and overtube), theseptum between the diverticulum and esophageal lumen can be successfully visualized and stabilized

without overextension of the neck. The incision was then made thorough different techniques including needle-knife, hookknife, argon plasma coagulation, and monopolar forceps. ^{7,13,19}

CASE REPORT

A 66-year-old man admitted to general surgery department for the complaint of weight loss and halitosis in the last one year. During the last two months he had suffered from intermittent periods of cough. From his medical records, he used to smoke but gave up smoking 15 years ago, was a social drinker and had not any chronic illness. Upper gastrointestinal-endoscopy and thorax CT were diagnosed. As a result of the tests and examinations, it was determined stage-two Zenker diverticulum on the upper part of esophagus and back to thyroid gland. It was the size of approximately 3-4 cm. It was planned elective-open diverticulectomy. The patient has been taken to the hospital on 19.10.2015 for preoperative preparations. Oral and written consent received from the patient. The patient has been starved 12 hours-before the surgery and face, neck and chest of the patient has been shaved. Under general endotracheal anesthesia, surgical process lasted one and half hours. The surgery was performed to open-servical insicion, myotomy and thoraco-abdominal stapler. diverticulum has been got out from back to thyroid gland. The patient successfully underwent surgery and stayed for five days in hospital. After the postoperative third day it was allowed the patient's oral feding and checked upper gastrointestinal area to control graphy with barium. There was not any abnormality. After an uneventful recovery and adequate oral intake, the patient was discharged on the fifth postoperative day. The patient has been proposed to avoid cigarettes and alcohol and recommended to eat only soft and liquid foods in the first month.

Nursing diagnoses, planning and implementation of ZD

Acute pain related to postoperative status

Expected outcomes: The patient's pain will be controlled or reduced to a tolerable level of 2 to 3 on a pain scale of 0 to 10 within 30 minutes of report of pain.

- Evaluate pain regularly, noting characteristics, location, and intensity on pain scale of 0 to 10 to provide information regarding patient's pain level and effectiveness of interventions
- Assess religion, culture, beliefs, and circumstances to determine impact on patient's pain and response to interventions
- Monitor incision noting any drainage, redness, swelling, or increased pain to assess for postoperative infection, which can increase pain level

- Take vital signs (note if tachycardia, hypertension, or tachypnea is present), which may indicate presence of acute pain
- Provide comfort measures such as positioning every
 2 hours and back rub to improve circulation and reduce tension associated with pain
- Use relaxation techniques such as deep breathing, guided imagery, music, and distraction therapy to enhance relaxation and improve pain relief
- Medicate as ordered on routine schedule for 24 to 48 hours to control postoperative pain and prevent pain from becoming unbearable for patient
- Ensure functioning of NG tube (usually low intermittent suction) to prevent distention and increased pain
- Notify physician if pain control measures are unsuccessful to allow revision of treatment plan.

Sleep problems related to acute pain and hospitalization

Expected outcomes

The provision of the patient's enough sleep and rest

- First of all, the patient's pain should be resolved
- Individual and environmental risk factors must be controlled (pain, noise, lighting condition)
- Drug and visit time must be regulated according to patient.

Fear related to body image changes, treatment, and lifethreatening illness

Expected outcomes

The patient will understand and discuss disease process and treatment options and possible outcomes of treatment before surgical procedure.

- Use open communication and convey acceptance of patient's fears to help patient cope with fears
- Explain disease process and treatment options, reinforce as needed to decrease patient's fear of the unknown
- Explain all postoperative procedures and interventions (such as medications, NG tube, drains) to help reduce the patient's fear.

Swallowing problem and aspiration risk related to surgical procedure

Expected outcomes

The patients understand treatment process and learn timing of liquid and solid food.

- Explain feeding options, decrease patient's fear of the uncertainty
- Explain and teach swallowing techniques

- Ensure onset aspiration after liquid swallowing
- Explain feeding position. For example, patient should not eat in lying position.

Postoperative nutrition less than body requirements

Expected outcomes

The patient will be controlled nutrition status and will be informed on malnutrition sign and symptoms.

- Should be given routine IV fluids and enteral/parenteral feeding solutions in patient's order
- Ensure IV fluids, enteral/parenteral feeding is enough for patient's requirements
- Discuss the alternative enteral feeding methods
- Patient weight should be measured every day.

Decrease physical coordination related to drainage tube

Expected outcomes

Maintaining a safe environment, mobilization as regularly.

- Evaluated physical coordination as regularly
- Explain moving techniques with drainage tube
- Measures taken about risk of falling; bed rails are opened
- Mobilized as regularly accompanied by a nurse.

Risk of postoperative constipation problem

Expected outcomes

The patient understanding will decrease gastrointestinal motility and will be aware that problem is onset defecation over 72 hours.

- Explain constipation define, increase in patient's knowledge
- Explain inhibitor effect of general anesthesia on intestinal motility
- Explain the effect of fluid intake and mobility on intestinal motility.

Infection risk related to surgical wound, drainage tube and hospitalization

Expected outcomes

Patient will be controlled infection signs and symptoms.

- Evaluate body temperature regularly and provide information
- Explain infection signs and symptoms (hyperemia, pain and local temperature of wound area, increased body temperature, change the contents of drainage)

• Explain that wound care should be performed with aseptic technique.

DISCUSSION

Zenker's diverticulum is a phenomenon with a fairly low incidence and it is more common in men than in women. Patients with Zenker's diverticulum usually admit to hospital with complaints of dysphagia. In our case study, the patient was a 66 years old male. On the other hand, in the etiology of Zenker's diverticulum motility disorder takes and important role, and it occurs following the herniation of pharyngeal mucosa. ^{12,13}

Patients with Zenker's diverticulum usually had symptoms such as dysphagia, weight loss, regurgitation, coughing, halitosis, and aspiration. If the diverticulum is wide, a noise of gurling can be heard from neck. In our case, there were coughing, weight loss and halitosis.

Zenker's diverticulum can be diagnosed with examination and detection of the diverticulum in the pharyngoesophageal segment. In our case study, upper gastrointestinal-endoscopy and thorax CT were diagnosed, 1,12-14

The treatment of Zenker's diverticulum can be done surgically, and the surgery can be performed with an open incision or with endoscopic methods. In our case, the surgery was performed to open-cervical incision, myotomy and thoraco-abdominal stapler. The diverticulum has been got out from back to thyroid gland.^{13,17}

After open surgical methods, the recovery may take more time. Besides, there are more risk for complications such as fistula, recurrent nerve damage and mediastinitis. Our case had stayed in the hospital for 5 days and discharged without any complications. During the routine controls after discharge, there wasn't any late complication.^{13,17}

In the surgical treatment of Zenker's diverticulum, open or endoscopic surgical methods were chosen according to the size of diverticulum. If diverticulum is less than two centimeters, a CP myotomyalone is sufficient. If diverticulum is between three and six centimeters, endoscopic or open procedure must be used. When the diverticulum exceeds 6 cm, an open approach is generally considered a more favourable procedure. 13,17

Endoscopic surgical methods can be listed as endoscopic diverticulotomy, rigid endoscopic diverticulotomy, endoscopic electrocautery (Dohlman'stechnique), endoscopic CO2 laser technique, endoscopic stapling technique, endoscopic harmonic scalpel, flexible endoscopic diverticulotomy. 13,15,17,18

Although the patients with Zenker diverticulum admit to hospital with dysphagia, the physical examination may seem normal and, this may delay the diagnosis.

Therefore, the patients in advanced age who admit to hospital with symptoms like dysphagia, weight loss, halitosis should be evaluated carefully with barium swallow test and endoscopic imaging methods. 13,15

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