



A Case Report of a Gastrointestinal Fistula Patient with Severe Complication

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Abstract

The management of gastrointestinal fistula still remains a tough challenge to most of surgeons. It is associated with high mortality and morbidity. The following case is biliary-enteric anastomosis fistula, with complicated and severe complications: sepsis, hemorrhage of digestive tract, malnutrition and disorder of electrolyte. Finally, the fistula closed by actively a bundle of therapeutic methods without operation. In this paper, we focus on two aspects of fistula management, source control and enteral nutrition. Adequate source control plays the most important role in management of fistula, especially with sump drainage tube. Enteral nutrition should be considered as possible as we can. We should try our best to establish a route delivering enteral nutrition in intricate situation of gastrointestinal fistula patient.

Introduction

Gastrointestinal fistula is defined as an abnormal pathological communication between skin surface and gastrointestinal track. It usually develops after abdominal surgical procedure. Despite advances in intensive care, nutrition support, antibiotics, wound local care, and surgical technique, gastrointestinal fistula continues to be a major challenge in management, with high morbidity and mortality. It would company many serious complications such as electrolyte disorder, malnutrition, severe sepsis, hemorrhage of digestive tract, even MODS (multiple organ dysfunction syndrome), if there has not an effective procedure to control intra-abdominal infection and fluid outflow from gastrointestinal track immediately. We want to share our experience in management of gastrointestinal fistula patient through following case report.

Case Presentation

The patient was female, 67 years old. She was admitted to our hospital in 2016-04-22. The chief complains were "post radical resection of pancreas ampulla carcinoma for 1 month, yellow fluid out flowed from abdominal drainage tube for 3 weeks, blood out flowed from stomach drainage tube for 1 week".

The patient underwent procedure of Whipple operation because of a mass in pancreas ampulla in 2016-03-21. The pathologic diagnosis was moderately differentiated adenosquamous carcinoma of pancreas ampulla. A week postoperatively, hyperpyrexia occurred accompanied with hypotension. Another important symptom was purulent fluid out flowed from abdominal drainage tube. According to serious condition the patient was transferred to ICU. The patient received fluid resuscitation, vasoactive agents and anti-infective therapy, the blood pressure gradually tended to stabilize. But fever still persisted. Type-B ultrasonic and CT check of abdomen found there was localized pyoperitoneum. Two pigtail drainage tubes were successfully set to abdominal abscess guided by Type-B ultrasonic. Symptom of fever seemly improved a little. The condition was changed on 3 weeks postoperatively; blood was seen in stomach tube accompanied with tarry stools, and again with high fever up to 39.0°C. Then the patient was transferred to our hospital in 2016-04-22 (4 weeks postoperatively).

Admission condition

Vital sign: T 37.4°C, P 98 bpm, R 21 times/min, BP 135/85 mmHg. Consciousness was clear, expression was anxious. There were no obvious positive sign with pulmonary physical examination. Abdominal physical examination: slightly distended, a long vertical incision with suture not yet removed. The lower part of incision was poor healing. A total seven drainage tubes were seen on abdomen. One was jejunal feeding tube, one was biliary-enteric anastomosis tube, and the other 5 were drainage tube of abdominal cavity. Yellow fluid could be seen in two tubes in right part

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Figure 1: The situation of abdomen while admitted to our hospital.

of abdomen, one was abdominal cavity drainage tube, and one was biliary-enteric anastomosis tube. Tenderness was diffused but not notable. Bowel sounds decreased. And dark red blood was seen in gastric tube, stool was tarry. The situation of abdomen while admitted to our hospital was shown in Figure 1.

Laboratory examination

WBC $17.6 \times 10^9/L$, N $15.1 \times 10^9/L$, N% 85.6%, RBC $2.38 \times 10^{12}/L$, Hb 75g/L, Hct 22.7%, PLT $231 \times 10^9/L$; ALT 45.7 u/L, AST 48.0 u/L, ALB 35.5 u/L, TBIL 34.2 mmol/L, DBIL 0 mmol/L, IDBIL 11.4 mmol/L, BUN 2.53 mmol/L, Cr 31 umol/L, k^+ 3.08 mmol/L, Na^+ 138 mmol/L, Ca^{++} 2.02 mmol/L, Mg^{++} 0.44 mmol/L; PT 13.30s, INR 1.17; Fecal occult blood (+++); Gastric occult blood (+++); Culture result (drainage of abdominal cavity): *Pseudomonas aeruginosa* growth.

Diagnosis on admission

1. Intra-abdominal infection, 2. Gastrointestinal fistula, 3. Hemorrhage of digestive tract, 4. Anemia, 5. Hypoproteinemia, 6. Hypokalemia, 7. Hypocalcemia 8. Hypomagnesemia, 9. Malnutrition, 10. Hypertension, 11. Pancreas ampulla carcinoma (postoperatively).

Result of radiography

Radiography was done as soon as possible. When contrast medium (meglucamine diatrizoate) was injected from one drainage tube (that was already set in procedure of Whipple's operation) in the right part of abdomen, we found the contrast medium went into a part of intestinal tract, and continued went into common bile duct then left and right hepatic ducts (Figure 2). Radiography of another 4 drainage tubes showed localized abscess cavity, found none contrast medium went into intestinal tract.

Strategy of therapy

Diagnosis of gastrointestinal fistula was clear, the site was on biliary-enteric anastomosis, the amount of fistula was only one, and type of fistula was enterocutaneous fistula. Complication of gastrointestinal fistula of the patient was complicated and severe: sepsis, hemorrhage of digestive tract, malnutrition and disorder of electrolyte.

Strategy of therapy was that firstly gave active conservative treatment in order to achieve the goal of stabilization of the condition and even fistula closing, if fistula didn't heal by the means of conservative treatment, definitive operation would be performed after at least 3 months.

There were two stages in the whole process of treatment. The goal of the first stage was controlled the patient's condition,



Figure 2: Result of radiography from one drainage tube in the right part of abdomen. The contrast medium went into a part of intestinal tract and continued went into bile ducts.

and meanwhile actively assessed situation of fistula, function of digestive tract and degree of intra-abdominal infection. Detailed procedures were following: fasted for solids and liquids; continuous gastrointestinal decompression; proton pump inhibitor was given; subcutaneous injection of octreotide; bacterial culture was performed, and meanwhile antibiotics were administrated by intravenous drip to covered spectrum of G+, G- and anaerobias; calcium gluconate, vitamin K_1 and FFP (fresh frozen plasma) were given to improve coagulation function; transfused RBC suspension to improved anemia; correcting electrolyte disorder; balanced body fluid; effective source control. Three original drainage tubes were changed into sump tubes which could continue negative draining while flushing (Figure 3). The other two pigtail tubes remained too irrigated intermittently. And another important measure was early ambulation.

Temperature was less than $38.0^\circ C$ for three days after given sump drainage method. On the 4th day after admission (2016-04-25) the patient got a fever up to $39.5^\circ C$ with obvious chill. Catheter of deep vein of right subclavian was removed immediately, a part of catheter was sending to have bacteria culture. Then temperature remained stable until the patient discharged from hospital. Symptom of blood fluid out flowed from stomach tube and tarry stools were gradually relieved. On the 5th day after admission (2016-04-26) fluid out flowed from stomach tube turned to be yellow-green, and symptom of tarry stools never occurred. Anemia, hypoproteinemia, hypokalemia, hypocalcemia and hypomagnesemia also significantly improved. Color of drainage fluids from the sump tube in right part of the abdomen changed gradually. The first two days it was yellow, and then light yellow, on the 4th day after admission (2016-04-25) it was complete clear just like the flushing fluid. Then radiography was done again to assess situation of fistula. When contrast medium (meglucamine diatrizoate) was injected from drainage tube, we didn't found the contrast medium went into intestinal tract, and also common bile duct, left and right hepatic ducts anymore.

When the condition has been effectively controlled, the second stage of treatment began. It was proved to be closed of the fistula by the result of radiography. The sump tube was with drawn little by little; meanwhile sump tube with smaller in diameter was used. The sump tube was removed when it withdrew until reached subcutaneous tissue. Moreover the other four drainage tubes were removed one by one gradually. There was only one tube remained which was jejunal feeding tube. The biliary-enteric anastomosis tube was also removed finally when total enteral nutrition support proceeds effectively.



Figure 3: The original tube on right lower abdomen has been changed into sump drainage tube which is a kind of double drainage tube.

Enteral nutrition support was considered when radiography indicated fistula closing. Short peptide type of enteral nutrition was used at the beginning from jejunal feeding tube, 20 ml/h, continuously pumped. Meanwhile partial parenteral nutrition support still used. Drop rate of enteral nutrition was up-regulate according to reflection of gut, finally up to 80 ml/h. Parenteral nutrition didn't administrated when drop rate of enteral nutrition got to 40 ml/h. When enteral nutrition began, therapies of proton pump inhibitor, octreotide, antibiotics were with draw. The fluid from biliary-enteric anastomosis tube was collected and then transfused into jejunal feeding tube as possible as it could be until the biliary-enteric anastomosis tube was removed.

The patient discharged from hospital with healing gastrointestinal fistula on 2016-06-04, total hospital stay was 43 days. The jejunal feeding tube was still remained. Family enteral nutrition support continued for at least one month.

Discussion and Summarize

Gastrointestinal fistula is not a common disease. Although rare, but it is associated with considerable morbidity and mortality. The management of it continues to present a tough challenge to most of surgeons. It also brings prolonged hospital stay, expensive medical cost and considerable psychological burden on patients [1-2].

We have been focused on the field of gastrointestinal fistula treatment since 2011. There are nearly 130 gastrointestinal patients transferred to our department underwent effective therapy by now. This is one of the typical, successful cases received systemic effective treatment. We want to share our opinion and experiences through this case; we hope there would be something useful for some surgeons who might encounter gastrointestinal fistula patient.

Adequate source control

There may be a bundle of therapeutic methods when encounter a gastrointestinal fistula, including parenteral and enteral nutrition support, acid suppressive therapy, application of somatostatin to let bowel rest, drainage, antibiotics, correct electrolytic disturbances, and local care of the fistula tract as well as emergency or definitive operation, et al. But above all, the most important measure we should perform is adequate source control. Uncontrolled infection is the most common cause of treatment failure and mortality. Inadequate source control results in uncontrolled infection. If inadequate source control persists, the following complications would occur: severe sepsis, sepsis shock, acute lung injury, acute kidney injury, malnutrition, metabolic acidosis, serious electrolyte disturbances,

dysfunction of coagulation, hemorrhage of digestive tract, bleeding from fistula tract and even MODS [3-4].

How can we get the goal of adequate source control? Drainage, change the type of drainage may has effective result. Although antibiotics play important role in treatment of intra-abdominal infection, but drainage can't be replaced by antibiotics. Drainage is always primacy in procedure of intra-abdominal infection. The common drainage tube placed in abdominal cavity during operation does not drain effectively; it is more likely a signal tube which could tell us whether there is bleeding or intestinal juice in abdominal cavity postoperatively. It is a kind of passive drainage, but not active drainage. Most of gastrointestinal fistula patients transferred to our department almost always remained this common drainage tube, companied with fever, disorder of metabolism, malnutrition even bleeding. In our department we change this common tube to another drainage tube that is sump drainage tube or called double-drainage tube, a kind of active drainage tube. There are two parts in the sump drainage tube. One is drainage part, connected with vacuum system in the wall, so it is active drainage. Another part is irrigation, connected with sterile saline liquid. This kind of sump drainage could get goal of adequate source control. Once achieving adequate source control, condition may get better soon and complication may decrease obviously. Even some gastrointestinal fistula may be closed by the sump drainage avoiding operation once more. This case showed a good outcome by adequate source control using the sump drainage tube. But one thing we should clear, this kind of sump tube isn't omnipotent, if it is used not correctly, side-effects may occur such as bleeding, aggravated infection, et al.

Enteral nutrition support

Enteral nutrition support also plays very important role in procedure of gastrointestinal fistula. Enteral nutrition should be considered as possible as we can. It has been already accepted that if gut works, use it. And as we all know, if a critical could use enteral nutrition, it is successful by half. So, enteral nutrition is another critical aspect as well as source control. Compare to parenteral nutrition, enteral nutrition has many advantages as following: it is more conformed to the physiological process of human body; it can protect intestinal barrier; it reduces bacterial translocation from gut; it improves hepatic function and reduces cholestasis; it has a better favorable benefits improving nutrition; avoiding catheter related blood stream infection; morbidity decreases when enteral nutrition begins. Also, enteral nutrition is cheaper than parenteral nutrition, and easier to handle even could be carried on at home [5-6]. According to our experience, once enteral nutrition support successfully developed, condition of patient would be stable than during the period of parenteral nutrition.

It is not simple to applicate enteral nutrition correctly. There are several things should be notice in gastrointestinal fistula patient. Firstly, only after hemodynamic stabilization, nutrition support could be considered including enteral nutrition. When a patient is in the situation of unstable hemodynamic, fluid resuscitation and vasopressors agents are always primary. Secondly, if we want to start enteral nutrition, a thorough evaluation of digestive track and fistula must be known well. To assess situation of digestive track and fistula, radiography is recommended. The investigation of digestive track by means of radiography can tell us the length of intestine and whether it is obstructed, and help us to decide whether enteral nutrition can be used. The investigation of fistula tell us site of fistula,

amount of fistula, and help us to decide how to use enteral nutrition, from nasogastric tube or from nasointestinal tube, or whether it is possible to collect intestinal contents then transfer into nutrient tube? If investigation of bowel and fistula is not clear, enteral nutrition shouldn't start until enough information about bowel and fistula is achieved. If there are several fistulas on abdomen, it is hard to use enteral nutrition. We should try our best to design an idea route to use enteral nutrition, even though a part of intestine. Utilize every part of intestine which still has function. It is easy to say but hardly to perform. The third, there is a specific duration that shouldn't use enteral nutrition. When it is possible to close fistula through a conservative treatment, total parenteral nutrition and somatostatin are applied in order to reduce secretion of gastrointestinal fluid. So it reduce amount of gastrointestinal fluid from fistula, meanwhile, accompany with effective drainage, promote closure of fistula. If enteral nutrition is used during this stage, effect of total parenteral nutrition and somatostatin would diminish because of stimulation to secret of gastrointestinal fluid enhanced.

Conclusion

This case is one of successful cured gastrointestinal fistula patient without definitive operation in our department. To our experience, adequate source control plays the most important role in management of fistula, especially with sump drainage tube, a kind of active drainage tube. On the other hand, enteral nutrition support also plays very important role in procedure of gastrointestinal fistula. Enteral nutrition should be considered as possible as we can. We should try our best to establish a route delivering enteral nutrition in intricate situation of gastrointestinal fistula patient. It is easy to say, but we will always counter unexpected situation because of individual difference in gastrointestinal fistula patients.

There are also many other aspects should be notice, but not mention in this paper. In this case we focus on above points of experiences in clinics. We hope it would be somewhat helpful to surgeon who might encounter gastrointestinal fistula. There must be some disagreements or incorrect points in the paper, welcome exchange experience together later.

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