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The Role of Octreotide in the Enterocutaneous Fistula Closure in Children

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Abstract

Background: Enterocutaneous Fistula (ECF) in children is a rare but a well-recognized complication after abdominal surgical interventions. The conservative management of the ECF is a challenge and a multidisciplinary approach is required. A clinical and chemical monitoring, bowel rest, intravenous antibiotics and parenteral nutrition therapy seems to be the pillar of the medical treatment. Octreotide can hasten the non-operative resolution of the ECF without complications.

Case report: We report the case of a 4-year-old patient with nonoperative closure of ECF after abdominal surgery treated successfully with conservative management including octreotide.

Conclusions: ECF has a high morbimortality and a multidisciplinary approach is required. The initial management should be conservative, and the quick decrease of the fistula output up until closure with octreotide may suggest the beneficial effect of this therapy.

Introduction

Enterocutaneous Fistulae (ECF) is pathological connection that develop between the gastrointestinal tract and the skin. The management of ECF is complex and challenging, particularly when it is associated with metabolic, septic and nutritional complications [1].

The essential of ECF management in children is the conservative treatment including parenteral nutrition, antibiotics, local wound care and somatostatin or somatostatin analogues like octreotide which lead to a fistula healing rate of 6%-75%. Somatostatin and octreotide were shown to be associated with an increased number of fistulas closed, a reduced time to closure reducing the enzyme content and the ECF flow and increased the hydroelectrolytic absorption [2].

We present our experience in the treatment of ECF with octreotide in a 4-year-old patient and a review of the literature.

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Case report

A four-year-old girl, with no past relevant medical history, presented to the emergency department due to 9-days history of diffuse abdominal pain and fever. She also complained of dysuria, diarrhea and vomiting. There were no other associated symptoms or relatives with the same symptoms. In the physical examination she was dehydrated, with diffuse abdominal distension and tenderness suggesting an acute abdomen. Laboratory work-up showed elevated inflammatory markers: Peripheral WBC count of 18800/mm3 with 64% polymorphs and C-reactive protein of 211.2 mg/L. Ultrasound scan identified an inflamed appendix with complex hypogastric fluid collection. She underwent surgery after antibiotic therapy and iv hydration. Laparoscopy revealed abundant purulent free fluid, with generalized intestinal and peritoneal inflammation (Figure 1). A sample of fluid was taken for microbiology and a safety appendectomy was ruled out leaving a *transperitoneal drainage*.

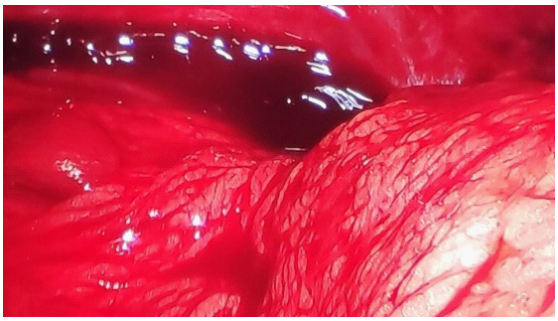

Figure 1: Laparoscopic approach showing an abdominal peritonitis with bowel inflammation and distention.

Postoperatively the patient was treated with on enteral nutrition and intravenous antibiotics without complication and the drain was removed on 4th postoperative day. Although, on postoperative day seven, bilious and gas drainage from the surgical umbilical wound (through a minimal skin dehiscence) was observed (Figure 2). A computer tomography scan was performed, that confirmed an ECF from ileus (Figure 3); the output progressively increased in 24 hours until 200 mL/day.

Figure 2: Surgical umbilical wound with bilious and gas drainage with a minimal abdominal skin dehiscence (red arrow).

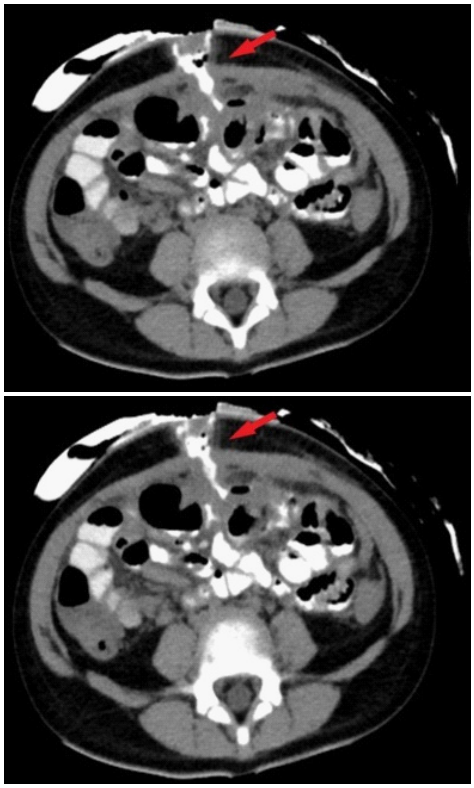

Figure 3: Enteral Contrast-enhanced computer tomography scan with two abdominal transversal views, showing the enterocutaneous fistula (red arrow).

After the diagnosis, the patient was referred to the Pediatric Intensive Care Unit (PICU) for clinical and biochemical monitoring and the medical therapy of ECF was started; the treatment protocol included bowel rest, broad spectrum intravenous antibiotic (piperacillin and tazobactam), Total Parenteral Nutrition (TPN) and octreotide to reduce the fistula output and facilitate early closure.

Parental consent was obtained for the use of octreotide which was administered 10 µg twice a day subcutaneously and maintained for 20 days. This resulted in a dramatic reduction of the fistulous drainage; by the 14th day of octreotide therapy, the drainage stopped completely and was gradually decreased to 5 µg twice a day subcutaneously and finally discontinued 6 days later. She started a liquid diet and progressed to a regular diet with no abdominal discomfort.

After the octreotide administration no side effects were recorded, and the tolerance was excellent in the patient.

There was a favorable outcome, full enteral feeding was tolerated, and the patient was discharged home after 3 days. On follow-up of 1 year the patient has remained asymptomatic with a regular diet and there was an appropriate growth and development.

Discussion

The ECF is the most common of all intestinal fistulas and requires prolonged hospital stay due to the high risk of complications such as electrolyte imbalance, malnutrition, metabolic disorders and sepsis [3]. Abdominal surgery is the leading causes (85%) of ECF and the mortality rate in children with small bowel ECF is 6-31% [4]. In order to prevent the referred complications a multidisciplinary team was performed in our center including pediatrician, pharmacologist, pediatric surgeon, clinical *nurse* specialist in chronic wound, psychologist and radiologist.

A multidisciplinary approach is required for successful management of these patients; the mainstay of treatment consists in wound care (local control of the effluent, requiring the skill and support of the specialist stoma care nurse), nutritional support, treatment of sepsis and correction of electrolyte imbalance [5,6,7]. For those reasons our patient was transfer to the PICU in order to clinical and biochemical monitoring; a *Central Venous Catheter* (CVC) was inserted to allow the parenteral nutrition and intravenous antibiotics therapy.

Based on the experience in adults, the somatostatin and its analogues have been used in pediatric patients avoiding a surgical treatment [8]. The clinically used octreotide act primarily by only binding to somatostatin receptor 2 reducing the enzyme content, the volume of biliary, pancreatic and gastric secretions and increasing the hydroelectrolytic absorption because it prolongs the gastrointestinal transit [2]. It has a much longer half-life (approximately 90 minutes, compared with 1-2 minutes for somatostatin).

Because it is absorbed poorly from the gut, octreotide is administered parenterally (subcutaneously, intramuscularly, or intravenously). The pharmacokinetic and pharmacodynamic differences between somatostatin and its analogues require continuous infusion with somatostatin and the parenteral route for analogues [9]. In our patient we administered octreotide 10 µg twice a day subcutaneously reducing the ECF volume from 200 mL/day to 10 mL/day in one week. After two weeks of treatment the ECF was closed and the octreotide dose was gradually decreased to 5 µg twice a day subcutaneously and finally discontinued after 20 days of treatment.

The most common side effects reported in children treated with octreotide are gastrointestinal symptoms (abdominal pain, vomits, diarrhea, cholelithiasis and vitamin B12 deficiency). Other relevant side effects are pulmonary hypertension and cardiovascular alterations (arterial hypertension and ventricular fibrillation in patient with arrhythmias or long QT syndrome).[10] The reported patient didn't present side effects.

Conclusion

The ECF is a rare condition in pediatric patients with high morbimortality. For this reason, a multidisciplinary management is required. The initial management of ECF should be conservative and octreotide administration could be considered in order to shorten the time to fistula closure, the requirement of parenteral nutrition therapy and hospital stay.

Author contributions

Conceptualization CLV; methodology CLV, FB; validation SBG; formal analysis CLV, IG, NBL, FB, MQG; investigation CLV; FB; writing original draft CLV.

All authors have read and agreed to the published version of the manuscript.

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