

Diagnostic Dilemma of Post-abortive Patient with Extensive Uterine and Colonic Necrosis Secondary to *Clostridium Perfringens*: Case Report at Saint Francis Referral Hospital Ifakara Tanzania

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ABSTRACT

Post abortive Uterine-colon necrosis secondary to *Clostridium perfringens* infection is extremely rare of unknown incidence. The most reported cases include abdominal or uterine perforation due to *C. perfringens* forming visceral necrosis. It is associated with significant morbidity and mortality. The pathogen produces Lecithinase C which is a phospholipase C and it is believed to be involved in the pathologic effects of *C. perfringens*. Below we present the post incomplete abortion who presented with acute abdominal conditions of which surgical intervention was performed in addition to broad-spectrum antibiotics. Intra-operatively, there was extensive uterine and colonic necrosis and the patient survived but remained with permanent complications of total hysterectomy and lack of colon.

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1. INTRODUCTION

Uterine-colon necrosis secondary to *C. perfringens* infection is rare condition associated with significant morbidity and mortality [1–3]. It is also among the surgical emergency associated with significant management challenge in general surgery [4–6] *C. perfringens* is non motile bacillus, encapsulated an anaerobic gram-positive bacterium [7,8]. The bacterium has the ability to produce multiple toxins [1,6,9,10]. One of the most lethal toxins is Alpha-toxin (lethicinase C), a phospholipase C which is an enzyme with ability to split the phospholipids lethicine and hence multiple cell destructions including red blood cells, platelets, endothelial cells, and the plasma membranes of muscle cell [2,3,8]. Through its synergistic effects with other toxins, lethicine C can be involved in many harmful reactions such as platelet aggregation, increased endothelial permeability, mis trafficking of neutrophils, erythrophagocytosis and stimulation of the production of endogenous mediators, such as tumor necrosis factor (TNF) and platelet-activating factor (PAF) [6,10]. Furthermore, lethicinase C is also involved in pathological processes, such as tissue necrosis, intravascular coagulation, hemodynamic collapse and multiorgan failure [3,5,11]. Pelvic and intraabdominal clostridial infection carry a high mortality rate because it is rarely diagnosed preoperatively [11,12]. Since its presentation is similar to other familial acute abdomen diseases, particularly peritonitis of any cause, hence timely surgical intervention is usually necessary to reduce the risk of death or permanent disability of the survivors [1,13]. Such as total hysterectomy in reproductive age and extensive loss of bowel loop which may lead to short bowel syndrome [11,13].

However, post abortion intra-abdominal pelvic *C perfringens* infection is among rare cases reported in the world of surgery and obstetrics as well [3,5,7] particularly in limited resources [3]. The most reported cases are uterine perforation due to gas gangrene secondary to *C. perfringens* [5,14,15] the other reported are colonic gas gangrene due to *C perfringens* in immunocompetent patients [4]. The treatment approach should focus on life serving Surgery as most patients present with acute peritonitis in critical condition [3,11,16]. The outcome in many patients may unfavorable causing loss of vital organs and body parts and poor functional outcomes [5,3].

Herein we present the post-abortion Clostridial infection who presented with extensive uterine and colonic necrosis at a rural referral hospital in Morogoro region.

2. CASE REPORT

A 29-years-old female with no known medical illness who was para 4 living 3, a peasant, a Sukuma in tribe, who had a negative history of any familial or acquired chronic disease. She arrived at our facility presenting with incomplete

abortion at a gestation age of 20 weeks where dilatation and curative was done at one of the dispensaries as an outpatient in rural areas. A few days later she developed a fever, and progressive abdominal pain, on the progression of illness, she went back to the previous dispensary where she was referred to the health center (HC). At HC she was admitted for five days and kept on Intravenous antibiotics (which was not mentioned on the referral note), however, there was no significant improvement, finally, she was referred to the district hospital. At the district hospital had diagnosed with acute peritonitis. On arrival she was hypotensive with BP of 100/54mm, tachycardia with the pulse rate of 132 p/min and 38.6 Celsius degree centigrade, she was anemic with HB 5.2 g/dl. The patient had a provisional diagnosis of Septic shock, severe anemia and acute peritonitis. Ultrasound was done which revealed extensive peritoneal fluid which was echogenic in nature. The patient was kept on ceftriaxone 2gm bid, IV metronidazole 500mg IV fluid administration and emergency blood transfusion. She received five units of blood; two units were given preoperatively one unit intraoperatively and the last two units were given postoperatively. After stabilization of the patient, she was subjective for emergency laparotomy. At the moment of laparotomy, the BP was 110 /60mmHg, pulse rate was 100p/min, urine output was 30ml/hr and the Hb was 7.1g/dl. Intraoperative findings were as follows: the uterus was inflamed anteriorly while the posterior wall was necrotized, but also other pelvic tissues were necrotized, furthermore, proximal part of rectum and the colon were completely necrotized including the whole colon with exception of about 10cm of ascending colon from the caecum. Distally, the rectal remnant was about 5 cm below the sigmoid-rectal junction while the rest portion was completely necrotized. Extensive evacuation of necrotic tissue was done carefully to prevent aggravation of bleeding. Then after necrotic tissue evacuation, irrigation was done with normal saline to clean the pelvic-abdominal cavity to leave the health tissues. In order to maintain the GI conduit, the colostomy was done along the remnant of ascending colon to the right anterolateral abdominal wall. After the operation she was admitted on close monitoring care. Four days after laparotomy and colostomy at the district hospital, the patient developed surgical incisional fecal discharge. Then the patient was referred to design Saint Francis Regional Referral Hospital (SFRH). At Saint Francis the patient was hemodynamic unstable with BP 108/54 m/Hg, Pulse rate 115P/min, temp rapture 38.2 °C But also at the incisional wound there was fecal discharge estimated to be 600cc per day. Emergence investigations done were Full blood count of which Hb was 7.5g/dl and WBC 21x 10⁹/L. Due to hemodynamic instability she was given IV fluid and blood transfusion was ordered. The antibiotics were not changed from which was prescribed at district level until after further investigation.

Abdominal ultrasound was done to assess the presence of intraabdominal fluids but it had no significant findings. Four hours later she was taken into theater for explorative laparotomy.

Intraoperative findings were two perforations along the mid ileum about 2cm and 1cm respectively. Further assessment was done to exclude the possible remnants of necrotic tissues. There were few necrotic remnants at the posterior

wall along the sigmoid area (it should be remembered that about 90% of the whole colon were necrotized and is no longer existing) which were re-evacuated and some necrotic tissues were taken for culture and sensitivity. Elio-perforation was sutured using vickly 2/0 and peritoneal irrigation was done using normal saline 4 liters. The colostomy was left in situ and abdomen was closed after the insertion of abdominal drainage to collect the post-operative fluid collections. After operation the patient was admitted to Intensive care unit (ICU) for proper critical care. She was given the second BT one unit, maintenance fluids DNS and Lingers lactate 3 liters (1.5 lit respectively) for 24 hours. On the second day the patient was transferred from the ICU to normal ward where she was admitted in the high dependent care. Control HB was done which revealed 9.2g/dl, the temperature was ranging within the normal range. The antibiotics (ceftriaxone and metronidazole) were not changed until the result for C/S, after 32 hours C/S resulted revealed the presence of *Clostridium perfringens* which was resistant to Ceftriaxone, metronidazole, Ampicillin and Clavulanic Acid; but sensitive to meropenem, Clindamycin and Cipro floxacillin. The patient was kept on meropenem 1gm tds for five days. In the ward the patient was progressing well on day three the NGT was removed, light physical activities (sitting by herself) and oral sips were initiated, but the catheter remained in situ. At day three the patient started to ambulate by walking around and urethral catheter was removed. The surgical wound and abdominal contour was among the daily assessment areas, however, there was no clinical importances detected. Control serum electrolytes were not checked due to patient financial constraints. At day five the patient was clinically stable and she was able to take normal meal and have normal walk, at this moment she was advised how to live with colostomy at home, including regular colostomy bag cleaning and stoma wash, the use of deodorants to prevent unpleasant fecal smelling. No any complication occurred throughout the hospital stay. On day 9 after laparotomy the patient was clinically stable and she was discharged from the ward.

3. DISCUSSION

Pelvic-abdominal Clostridia infection is among rare cases reported in the literature of which only 18 cases are reported of which 13 cases were pregnant related and this becomes the 14th reported case in the literature, however, the compound of uterine and enteric gangrene secondary to *clostridium* infection is extremely rare [1] and probably with unknown incidence. This becomes another case among the few reported complex uterine- colonic necrosis due to clostridia infection. *Clostridium perfringens* septicemia and bacteremia is very rare associated with high mortality about 85% [1,6,17]. Lecithinase C toxin is responsible for the rapid onset of symptoms that can be seen as soon usually within 12-24 hours after Infection [1,3,11]. Abdominal pelvic clostridia infection should be considered in a patient presenting with post abortive nonspecific pelvic abdominal conditions and symptoms of shock [5,6,11].

According to Russell theory, there are three conditions in order clostridia infection of the uterus to occur: first, there should be bacterial introduction from either an external or internal (normal flora source. Second there should be a period of time

to allow bacterial incubation. Lastly, there should be an exposure of the damaged to the bacterial pathogen [1,11]. In this patient, there was incomplete abortion and instrumental evacuation. These two factors may be a combination of bacterial introduction or either of the two. Regardless of the source of infection the involvement of bowel necrosis is most probably the result of hematogenous spread or local invasion [1,2,7,12]. No matter the source of infection, in this patient the extensive visceral gangrene left the irreversible complication involving total hysterectomy in reproductive age and loss of colon. Lack of colon effect include electrolyte and water malabsorption. Furthermore, due to loss of colon, the patient is subjected to have permanent colostomy which will lead to individual psychological impairment. But also, the patient will have social stigmatization from family members and other related people at the community level.

Management of extensive pelvic-abdominal necrosis secondary to *C. perfringens* involved surgery and intravenous antibiotic which seem to have a significant contribution to patient's Survival as it has been reported in other cases [5,13]. Surgical removal of debrides and necrotized tissues is required to assess the severity of the infection accurately [1,5]. The use of hyperbaric oxygen (HBO) could have been an additional treatment as it is recommended in the literature [4,8,11] but it was not used due to availability at our set up. Furthermore, it is reported to have clinical importance in an open wound and in clear estimation of infection [1]. However, pre and post- surgical use of HBO has been reported to decrease toxemia and quick recovery [1,11]. Our patient had delay diagnosis and hence delayed surgical intervention. The main reason was the long distance between her residence, the health center and the district hospital (the total estimated distance is 90Km) where the explorative laparotomy was performed. But also, there was a limited surgical experience at the district hospital which led to postoperative peritoneal necrotic remnants which caused re-infection which required re-laparotomy by expertise surgeon. This becomes the among the few cases pelvic- abdominal gangrenous due to *C perfringens* [1,17], but identical case due it is nature involving extensive visceral gangrene. There is a probability that, this patient could have died if there was not rural referral hospital (Saint Francis Referral Hospital) [18].

4. CONCLUSION

Pelvic-abdominal *clostridium* infection should be suspicious of index especially in post abortive patient presenting with nonspecific features of surgical acute abdomen. Emergence surgical intervention remain life serving to the patient who present with gangrenous pelvic abdominal visceral. Culture and sensitivity in patient with necrotizing uterine and colitis respectively, is significantly recommended to prevent further unfavorable outcomes which usually caused be necrotizing agents holding high AMR profiles. The diagnostic measures such as imaging should be improved just from primary health care including ultrasound and C/S which could have detected the condition at the primary health center. Furthermore, there is a need of improving specialized medical health professionals in rural and remoted areas particularly in Tanzania through the country.

ETHICAL CONSIDERATION

The guidelines for international medical health research and national medical research and good clinical principals were obeyed such that, the patient signed informed consent before narrating this case. The patient particulars including name and personal confidentialities were maintained, no name or special characters were used during writing this manuscript. No payment, made to the patient in order to be involved in this case writing. Ethical approval was obtained from Saint Francis internal reviewer board to submit and finally publish this manuscript [19,20].

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILLOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

AUTHORS' CONTRIBUTIONS

All authors had significant contribution during writing this manuscript. Finally, all authors read and approved the final manuscript.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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