JMSCR Vol||05||Issue||01||Pages 17153-17156||January 2017

www.jmscr.igmpublication.org
Impact Factor 5.84
Index Copernicus Value: 83.27
ISSN (e)-2347-176x ISSN (p) 2455-0450
crossref DOI: https://dx.doi.org/10.18535/jmscr/v5i1.147

IGM Publication
Journal Of Medical Science And Clinical Research
An Official Publication Of IGM Publication

Meleney's Gangrene: Simple Debridement and Antiseptic Dressings can save a Patient's Life

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Abstract
Meleney's gangrene is a rare, rapidly spreading destructive subcutaneous tissue infection which most commonly occurs at post-surgical sites and has a mortality rate of as high as 30-40% (up to 90% in diabetics). Diagnosis of meleney's gangrene is difficult as the initial signs are not specific. If recognised and treated early the prognosis of this disease improves significantly. The major approach for treatment of meleney's gangrene is aggressive debridement and good antibiotic cover.
We hereby present a case of a female diabetic patient who had come to our centre on account of spreading infection and septic shock, who was aggressively resuscitated and taken up for emergency surgery in the form of aggressive debridement and was then managed with serial debridement and antiseptic dressings. The patient was successfully discharged on post op day 35 and the wound healed completely by post op day 70.
We report this case due to its rarity and its clinical importance and how aggressive debridement and antiseptic dressings are the best cure for this disease even after a century of its discovery.
Keywords: *Meleney's gangrene, Post-operative synergistic gangrene.*

Introduction

Meleney's gangrene is a rare, rapidly spreading destructive subcutaneous infection which most commonly occurs in post-surgical sites. A type of necrotising fasciitis it is also called progressive bacterial synergistic gangrene as its severity is believed to be due to synergistic effects of multiple bacterial infections. First described by Dr Meleney and Dr Brewer in 1926,[1] its microbial effectors were further classified by Dr Meleney in 1931.[2]The mortality rate due to Meleney's gangrene is as high as 34%.[3]

We present a case of a 44-year Indian female with meleney's gangrene following total abdominal hysterectomy who was successfully treated with aggressive debridement, antibiotics and antiseptic dressings. We report this case due to its rarity and importance of early identification.

Case Report

A 44 year Indian female referred to our centre on account of spreading infection and septic shock 15 days following total abdominal hysterectomy and bilateralsalpingo-oophorectomy done at a camp in periphery of Himachal Pradesh.

On general physical examination at the time of presentation patient was febrile with a temp of 102.8^{o}F, had a pulse rate of 120/min, blood pressure of 84/60 mm Hg and was tachypnoeic with a respiratory rate of 30/min. On local examination a 10cm long Pfannenstiel incision was seen with foul smelling purulent discharge from multiple sites over the incision. Gross abdominal wall edema and tenderness extending from umbilicus to bilateralmid-thigh was seen. Multiple small ulcers were present around the incision site till around mid-thigh. An urgent venesection followed with aggressive resuscitation with fluids was carried out thereafter.

Routine investigations showed haemoglobin of 10.1g/dl, total leucocyte count of 24,800 with 90.5% neutrophils, blood urea nitrogen 48mg/dl, serum creatinine 1.8mg/dl, random plasma glucose – 214, HbA1C – 9.2%. Plain x ray abdomen was found to be within normal limits. Ultrasound for collection was done which showed no intra-abdominal collection.

With a diagnosis of synergistic gangrene patient was taken for emergency surgery in the form of local debridement under spinal anaesthesia which revealed gangrene of the anterior abdominal wall with extensive involvement of fascia (fig. 1). Dead tissue was excised, wound washed with copious saline, 3 corrugated drains were put at 3 different sites and wound dressed. Injectable clindamycin, metronidazole, piperacillin – tazobactam were started. Insulin for control of diabetes was given.

Wound c/s was sent which reported anaerobes and klebsiella species which was resistant to all the known antibiotics.

Daily debridement and twice daily dressings with hydrogen peroxide and povidone iodine were done. Patients general condition and wound progressively improved (fig 2). The counts returned to normal on 10th post-operative day. Healthy granulation tissue was seen at the base of the wound, drains were removed. On 25th post op day 4 loose approximating sutures were applied. On 30th post op day repeat wound cultures were sent which were reported to be sterile. Patient was discharged on 35th post op day. After 15 days when the patient came for follow up skin defects had contracted and the margins were healthy so secondary suturing was done and patient told to review after 20 days. The wound had healed completely on follow up (Fig.3).

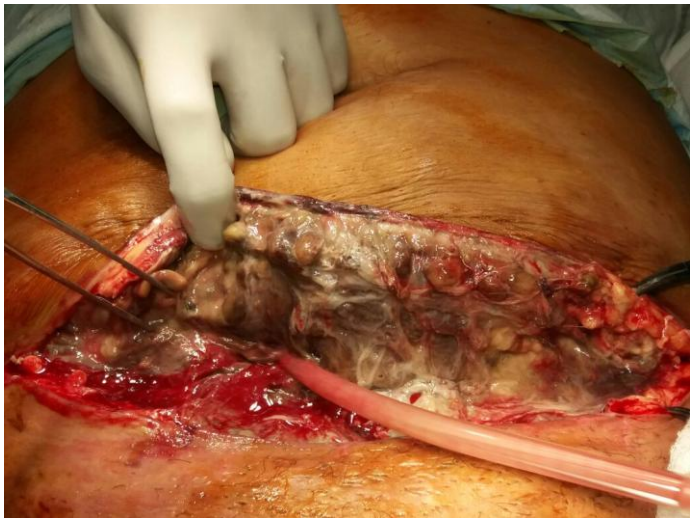

Fig.1 Intraoperative finding showing necrosis of subcutaneous tissue

Fig. 2 Healthy granulation tissue on 8th postoperative day

Fig. 3 Complete healing of wound on 70th postoperative day

Discussion

Meleney's gangrene affects the skin and subcutaneous tissues but not the deep fascia except in advanced cases; it may follow intra-abdominal surgery, around the incision or sutures[4] but cases associated with colorectal disease, genitourinary disease, fistulae or occurring spontaneously are also described.[5]

It is a rare, deadly form of necrotising fasciitis which begins as a superficial small ulcer post-surgery, followed by infection of subcutaneous tissue which leads to small vessel thrombosis and eventually necrosis.[6]

Most patients with post-operative synergistic gangrene have pre-existing immunosuppressive conditions such as chronic renal failure, HIV, diabetes mellitus or are elderly. Our patient also had raised blood sugar and HbA1C levels, but was not a known case of diabetes.

Meleney demonstrated a consistent bacterial picture that comprised of a streptococcus which could be isolated from the advancing edge of the lesion and gram negative rods which could be identified from the central necrotic area.[2] In our case a mixed growth of anaerobes and klebsiella could be isolated from the wound. The absence of streptococcus in our case is probably due to antibiotic coverage given to her before she presented to us.

Diagnosis of meleney's gangrene is difficult as early signs are usually very vague and are misdiagnosed as cellulitis or abscess. Frieschlag et al in 1985 found that meleney's gangrene if treated after 24 hours of recognition had mortality rate as high as 70% as compared to 35% if treated within 24 hours.[7] The diagnostic criteria for Meleney's ulcer includes: a slowly progressive superficial necrotizing process; evidence of a variety of microaerophilic, anaerobic, facultative, or amoebic organisms; hypoxic wound environment; and microvascular thrombosis in a full thickness ulcer.[6] In any case of post-operative gangrene a plain radiograph should be taken for presence of gas to differentiate it from gas gangrene. In our case plain radiographs were within normal limits.

When Dr Brewer and Dr Meleney first described this condition in 1926 the treatment of choice was zinc oxide and surgical debridement.[1] With introduction of newer antimicrobials zinc oxide was replaced with modern day antibiotics as the choice of treatment. Even though these antibiotics significantly reduce the bacterial load they have a little effect on the primary site. So aggressive surgical debridement is most important.Serial debridements are usually necessary to completely remove the dead devitalised tissue. Additional treatment measures such as hyperbaric oxygen therapy can be used as an adjunct to this. Combination of increased pressure and high oxygen concentrations in hyperbaric oxygen therapy allows for large amounts of oxygen to be dissolved into the blood and tissues, allowing for the revitalization of tissues with poor circulation.[8] After the necrotic spread has been terminated, hyperbaric oxygen therapy may further promote healing by stimulating angiogenesis and granulation tissue formation. In our case the patient was taken up for emergency aggressive debridement followed by serial debridement done at bedside along with antibiotic cover in the form of clindamycin, metronidazole and piperacillin tazobactam. Hyperbaric oxygen therapy was not used due to non-availability of the same in our setup.

Conclusion

Unfortunately, many signs of meleney's gangrene are initially overlooked which leads to unnecessary higher mortality. In the post-surgical patient, signs of sepsis, wound dehiscence and discharge at the operative site may suggest Meleney's gangrene. The essence of treatment lies in aggressive debridement and good antibiotic cover. Healthcare providers at the periphery should be made aware of this condition for its prompt recognition and diagnosis.

Acknowledgements: None
Source of support: None

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