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Original Research Paper

General Surgery

MELENEY'S SYNERGISTIC GANGRENE: A CASE SERIES OF FOUR PATIENTS WITH HETEROGENEOUS PRESENTATIONS AND SURGICAL OUTCOMES FROM A TERTIARY CARE CENTRE

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ABSTRACT **Background:** Meleney's synergistic gangrene (MSG) is a rare necrotizing soft tissue infection characterized by progressive subcutaneous necrosis, severe pain, and delayed systemic toxicity. Its indolent onset and polymicrobial etiology frequently result in delayed diagnosis and poor outcomes. **Methods:** Over a 12-month period, four patients with MSG involving different anatomical sites were managed at a tertiary care hospital. Clinical features, comorbidities, microbiology, surgical interventions, and outcomes were prospectively analyzed. **Results:** Three patients survived following early resuscitation, broad-spectrum antibiotics, serial surgical debridement, negative pressure wound therapy, and delayed reconstruction. One immunocompromised postoperative patient succumbed to multiorgan failure despite aggressive management. **Conclusion:** MSG requires a high index of suspicion, especially in postoperative or high-risk patients presenting with disproportionate pain and progressive skin changes. Early debridement and multidisciplinary care remain the cornerstones of management. Delayed diagnosis and immunosuppression are associated with poor outcomes.

KEYWORDS : Meleney's Gangrene; Necrotizing Soft Tissue Infection; Surgical Debridement; Negative Pressure Wound Therapy; Postoperative Infection

INTRODUCTION

Meleney's synergistic gangrene (MSG), first described by Meleney in 1924, is an uncommon variant of necrotizing soft tissue infection caused by synergistic interaction between aerobic and anaerobic organisms, classically Staphylococcus aureus and microaerophilic streptococci [16–18]. Unlike necrotizing fasciitis, MSG demonstrates a deceptively slow radial spread with extensive subcutaneous undermining and delayed systemic toxicity, often leading to diagnostic delay [9,20].

MSG typically follows surgical procedures, minor trauma, or skin breakdown, particularly in patients with diabetes mellitus, malnutrition, tuberculosis, malignancy, or immunosuppression [7,23]. Clinically, it presents with severe pain out of proportion to cutaneous findings, violaceous margins, foul discharge, and progressive ulceration [1,25]. Mortality ranges from 10–40%, particularly when surgical intervention is delayed [4,15].

We present four cases of MSG with diverse anatomical involvement and host factors, highlighting diagnostic challenges, management strategies, and outcomes.

Methods

Between January 2024 and January 2025, four patients with clinically diagnosed MSG were treated at our institution. Diagnosis was based on clinical features supported by imaging and intraoperative findings. Empirical broad-spectrum antibiotics were initiated immediately and later tailored to culture results. Serial surgical debridement was performed until viable tissue margins were achieved. Negative pressure wound therapy (NPWT) and reconstructive procedures were employed as indicated. Outcomes assessed included survival, need for reconstruction, and recurrence within 90 days.

Case Summaries

Case 1

A 48-year-old male on antitubercular therapy developed progressive necrosis at a postoperative colostomy closure site. Despite emergency debridement and escalation of antibiotics, he developed septic shock and multiorgan failure, succumbing on postoperative day 8. This case highlights the adverse impact of immunosuppression and delayed recognition in postoperative MSG [8,22].

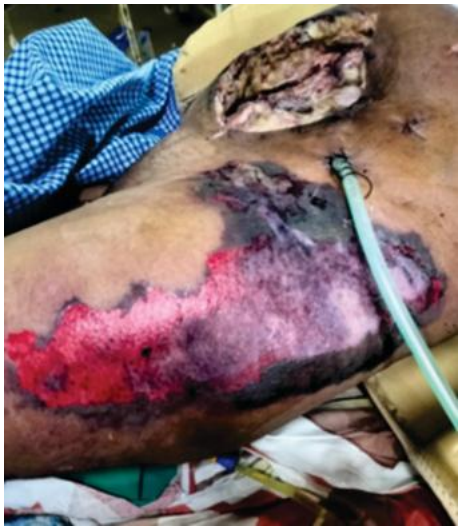

Fig 1- Showing Violaceous Discoloration, Foul-Smelling Discharge, and Progressive Necrosis, Extending to the Perineum and Proximal Left Thigh

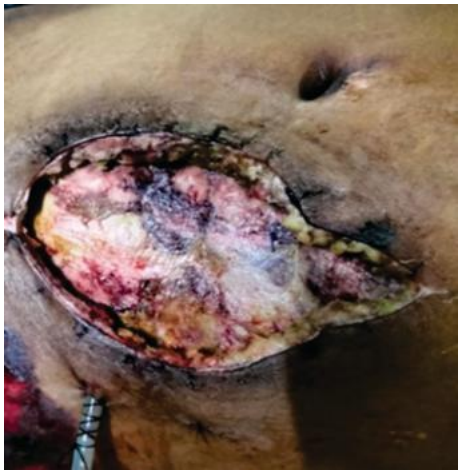

Fig 2- Showing Wound Dehiscence Along-With Discoloration and Foul-Smelling Discharge and Progressive Necrosis Along the Closure Site

Case 2

A 55-year-old chronic smoker presented with suprapubic and

bilateral scrotal involvement. Early aggressive debridement, serial wound exploration, NPWT, and delayed skin grafting resulted in complete recovery without testicular loss. Smoking-related tissue ischemia likely contributed to disease severity [21,26].

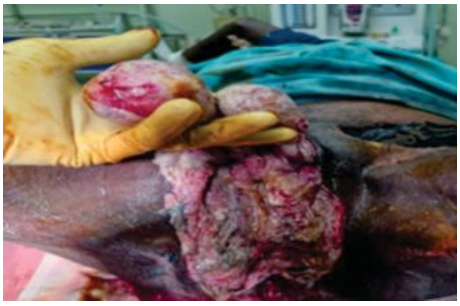

Fig 3- Extensive Erythema, Crepitus, Foul-Smelling Purulent Discharge, and Blackish Necrotic Patches Over the Bilateral Scrotum With Exposed Testicles

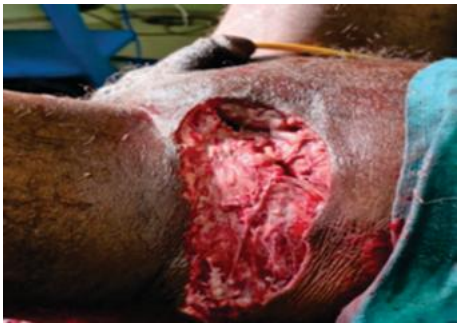

Fig 4- Post Debridement Picture of Bilateral Inguinal Area with Still Patches of Purulent Areas

Case 3

A 32-year-old immunocompetent woman presented with early MSG involving the mons pubis and vulva. Imaging excluded fascial involvement. Conservative management with targeted antibiotics and local wound care led to complete healing without surgical debridement, demonstrating that selected early cases may be managed non-operatively [5,10].

Fig 5- Involvement of Mons Pubis and Vulva with Focal Areas of Superficial Necrosis

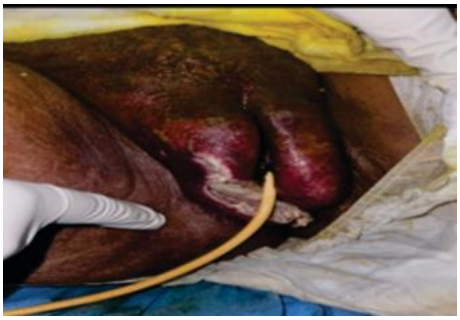

Fig 6- Superficial Necrotic Patches on Vulva and Lower Abdomen

Case 4

A 58-year-old poorly controlled diabetic female developed extensive perineal and thigh involvement. Multiple debridement, NPWT, and delayed reconstruction using split-thickness skin grafts and local flaps resulted in good functional recovery. Diabetes and delayed presentation were major contributors to disease extent [1,4,23].

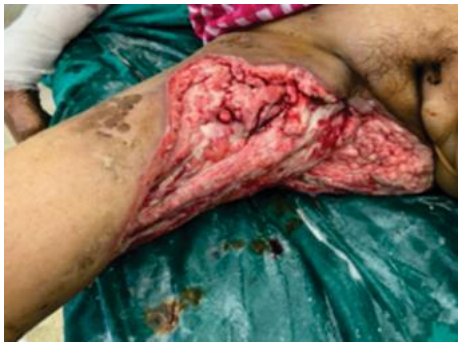

Fig 8- Extensive Tissue Involvement of Right Sided Perineum Extending Into Medial Aspect of Thigh.

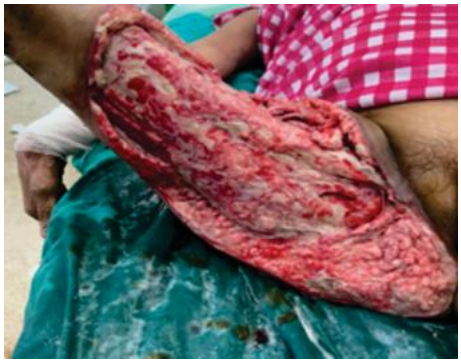

Fig 9- Extensive Tissue Necrosis Involving Almost Whole Thigh

DISCUSSION

MSG remains a diagnostic challenge due to its rarity and indolent early course. Severe pain disproportionate to physical findings, progressive undermining, and poly-microbial infection are key clinical clues [20,25]. Unlike necrotizing fasciitis, early systemic toxicity may be absent, leading to delayed intervention.

Our series demonstrates wide variability in host factors and disease severity. Immunosuppression, diabetes, smoking, and delayed referral were associated with extensive tissue loss and poorer outcomes. Early and repeated surgical debridement remains the most important determinant of survival [4,15]. Clindamycin plays a critical adjunctive role due to its antitoxin effects in streptococcal infections [24].

NPWT facilitated wound healing and simplified later reconstruction in survivors, supporting its role as an adjunct rather than a substitute for surgery [2,19]. Early involvement of plastic surgeons improved functional and cosmetic outcomes.

CONCLUSION

Meleney's synergistic gangrene is a rare but potentially fatal necrotizing infection requiring early recognition and aggressive multidisciplinary management. A high index of suspicion, prompt surgical debridement, broad-spectrum antibiotics, and meticulous supportive care are essential to improve survival and reduce morbidity.

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