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Perineal Gangrene: Clinical and Therapeutic Features and Pronostic Analysis of 35 Cases

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1. Introduction

Perineal gangrene is a cellulo-fasciitis secondary to a polymicrobial infection whose evolving is rapidly changing and unpredictable. Its prognosis is poor in spite of an appropriate therapeutic management. We have analyzed retrospectively 35 consecutive cases of perineal gangrene treated in the "A" surgical department of Charles Nicolle hospital (Tunisia). Our aim was to describe the clinical and therapeutic features and to analyze the prognostic factors that may influence the postoperative course.

2. Methods

Our retrospective study analysed 35 consecutive cases of perineal gangrene treated in the "A" surgical department of Charles Nicolle hospital (Tunisia) between 1997 and 2004. All the cases of perineal gangrene were included whatever the gateway: proctologic, urogenital, post-traumatic or postoperative. Gangrene that did not reach the perineum and perianal suppuration without cellulitis nor myonecrosis mentioned on the operative report were excluded. For each patient we studied age, sex, medical history, risk factors, etiology, diagnosis delay, topography, extent of lesions, clinical severity signs, results of laboratory workup and morphological examination. The therapeutic armamentarium consisted of intensive care including the correction of hypovolemia and electrolyte disorders, antibiotic therapy against anaerobic bacteria, gram-negative bacilli and gram-positive cocci, and surgical treatment consisting of iterative excisions, drainage, dressing change in the operating room and stomas if necessary.
The simplified severity index in its second version (SSI II) and the Fournier gangrene severity index score (FGSIS) were calculated from clinical and biological parameters in order to assess the severity of the initial clinical syndrome and to include these scores in a prognostic analysis. A univariate analysis using SPSS 11.5 was performed to search for prognostic factors that could influence mortality. Then we tried, through a multivariate analysis to identify independent risk factors with a significance level of 0.05.

3. Results

Between 1997 and 2004, 35 patients with perineal gangrene were supported in the "A" surgical department of Charles Nicolle hospital. The average age was 50.3 (± 14.1), there

were 25 men and 10 women. 23 patients had diabetes, 10 had hypertension. Regarding the etiology, 18 (51.4%) had perianal suppurations, 9 (25.7%) had abscesses of the buttock, and 5 had a urogenital infection. Time before diagnosis ranged from 3 to 30 days with an average of 12.71 (± 8.37) days. Among the initial symptoms, perineal pain was found in 30 patients (85.7%), pyrexia was found in 31 patients (88.6%). One patient had initial shock (case n°4). Bacterial gas production was revealed by subcutaneous crackling found in 3 patients (8.6%) (Cases n°2, 4 and 22), or by signs in the radiography found in one case (case n°2). Leukocytosis (white blood cell count >10 000/mm^3) was found in 29 patients (82.9%). The anatomic lesions consisted in cellulitis and myonecrosis in 34.2% cases. The extent of cellulitis and myonecrosis are represented in figures 1 and 2. All the patients had an almost-standardized treatment protocol consisting in 3 main measures: intensive care, antibiotic therapy and surgery. Intensive care comprised volume expansion, oxygen therapy and correction of metabolic and electrolytic disorders. Transurethral catheterization was performed in 7 patients while 3 patients had suprapubic catheterization. Antibiotic therapy was introduced since the admission. It was a tentative therapy covering anaerobic bacteria, gram-negative bacilli and gram-positive-cocci. The combination penicillin-gentamicin-metronidazole was prescribed in 88.5% cases. Ofloxacin was used when patients were allergic to beta-lactam antibiotics. None of our patients had hyperbaric oxygen therapy. Surgery was performed under general anaesthesia and comprised wide cutaneous, subcutaneous and muscle excisions up to healthy limits. Washing with hydrogen peroxide was always used. Wounds were left widely opened and corrugated drainage sets were used in the subcutaneous and muscle detachments. 30 patients (85.7% cases) had iterative excisions under general anaesthesia. The number of excisions ranged from 1 to 11 with an average of 3.2 ±2.9. 2 patients had lateral colosigmoidostomy because of a huge circumferential decay of the anal canal and the rectum (cases n°3 and 16). Postoperative mortality affected 6 patients (17.1%). The average age of deceased patients was 54. Characteristics of these patients are summarized in table I. Deaths were secondary to septic shock in 4 patients. Decompensation of a previous disease led to death in 2 cases. Death occurred between day 1 and day 39 after surgery. Length of stay ranged from 2 to 64 days with an average of 15.31 days ±13.29.

The postoperative course was complicated in 9 patients (25.7%) secondary to decompensation of previous diseases (table I). Restoration of continuity was performed in 2 patients (cases n°3 and 16) within respectively 9 and 13 months with no additional morbidity. One case of anal incontinence was noted as a postoperative sequela (case n°8). No urogenital sequelae were observed. The univariate analysis (table II) showed that mortality was significantly influenced by the spread of cellulitis, the presence of myonecrosis, the occurrence of septic shock, the postoperative need for mechanical ventilation and severity scores (SSI II and FGSIS). The multivariate study did not identify any independent factor of mortality.

4. Discussion

Perineal gangrene is a rare and serious complaint that poses a nosological problem leading to varied terminology: Meleney syndrome, synergistic necrotizing cellulitis, necrotizing fasciitis, clostridial gas gangrene and Fournier's disease [1,2]. It's defined as a necrotizing

Case	Age	Sex	Etiology	Diagnostic delay (days)	SSI II	FGSIS	Number of iterative excisions	Postoperative course
1	63	F	Anal suppuration	10	28	4	2	decompensation
2	29	M	Anal suppuration	9	19	5	10	uneventful
3	65	F	Bartholinitis	21	45	17	5	decease
4	43	M	Anal suppuration	7	59	13	0	decease
5	60	M	Abscess of buttock	30	20	1	4	uneventful
6	30	M	Scrotal infection	15	11	3	5	uneventful
7	67	M	Anal suppuration	10	38	9	1	decease
8	54	M	Anal suppuration	17	21	4	1	uneventful
9	49	M	Anal suppuration	23	15	3	0	decompensation
10	36	M	Abscess of buttock	7	11	4	4	uneventful
11	66	M	Anal suppuration	10	20	1	7	decompensation
12	45	F	Anal suppuration	15	18	4	1	uneventful
13	48	F	Inguinal lymphadenitis	30	38	13	2	decease
14	51	M	Bedsores	30	33	7	0	decease
15	57	M	Abscess of buttock	7	15	4	2	uneventful
16	22	M	Post-trauma	13	15	9	11	uneventful
17	77	M	Anal suppuration	7	44	0	0	uneventful
18	52	F	Bartholinitis	7	21	2	2	decompensation

Case	Age	Sex	Etiology	Diagnostic delay (days)	SSI II	FGSIS	Number of iterative excisions	Postoperative course
19	61	M	Anal suppuration	10	26	3	1	uneventful
20	47	M	Anal suppuration	7	18	3	2	decompensation
21	76	M	Abscess of buttock	21	4	0	2	uneventful
22	43	M	Anal suppuration	3	18	2	2	decompensation
23	63	M	Anal suppuration	7	20	1	1	uneventful
24	29	F	Abscess of buttock	30	33	7	3	uneventful
25	57	F	Bartholinitis	3	18	7	2	decompensation
26	25	F	Anal suppuration	7	14	5	3	uneventful
27	50	M	Anal suppuration	24	15	1	1	uneventful
28	58	F	Anal suppuration	15	21	5	1	uneventful
29	26	M	Anal suppuration	6	10	11	1	uneventful
30	55	M	Abscess of buttock	6	20	5	6	uneventful
31	41	M	Abscess of buttock	6	16	0	0	uneventful
32	53	M	Abscess of buttock	7	18	4	1	decompensation
33	61	F	Anal suppuration	15	26	5	1	uneventful
34	52	M	Scrotal infection	5	15	0	1	uneventful
35	50	M	Abscess of buttock	5	18	4	10	decease

SSI II: simplified severity index in its second version; FGSIS: Fournier gangrene severity score index

Table 1. Characteristics of studied cases

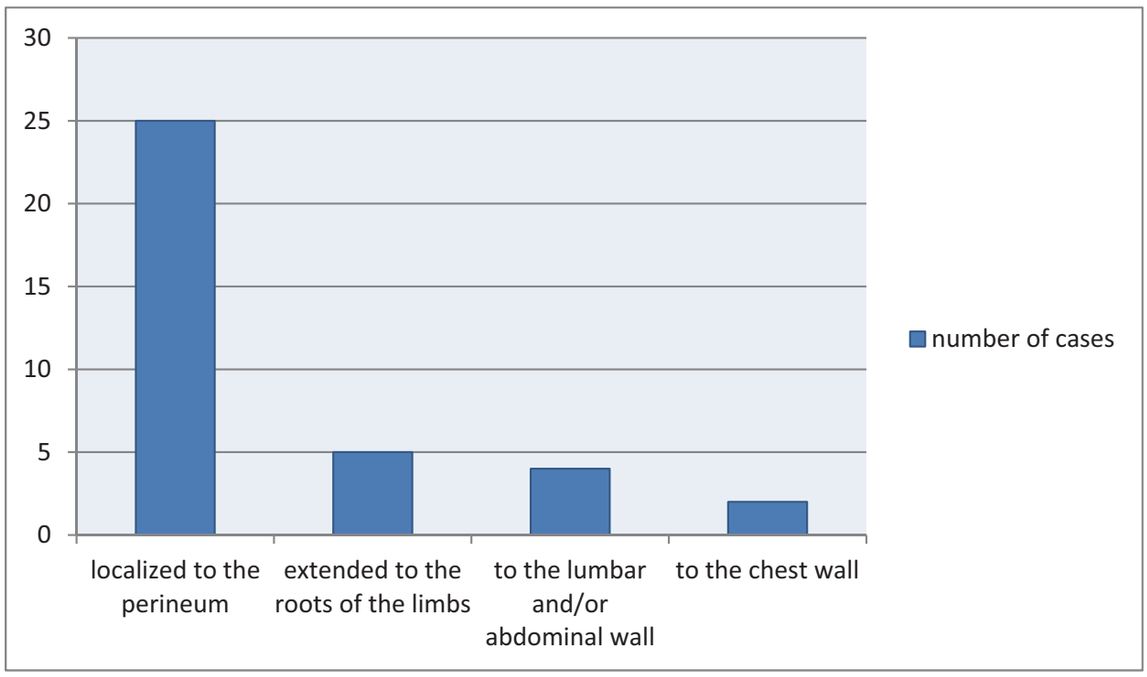

Fig. 1. Extent of cellulitis

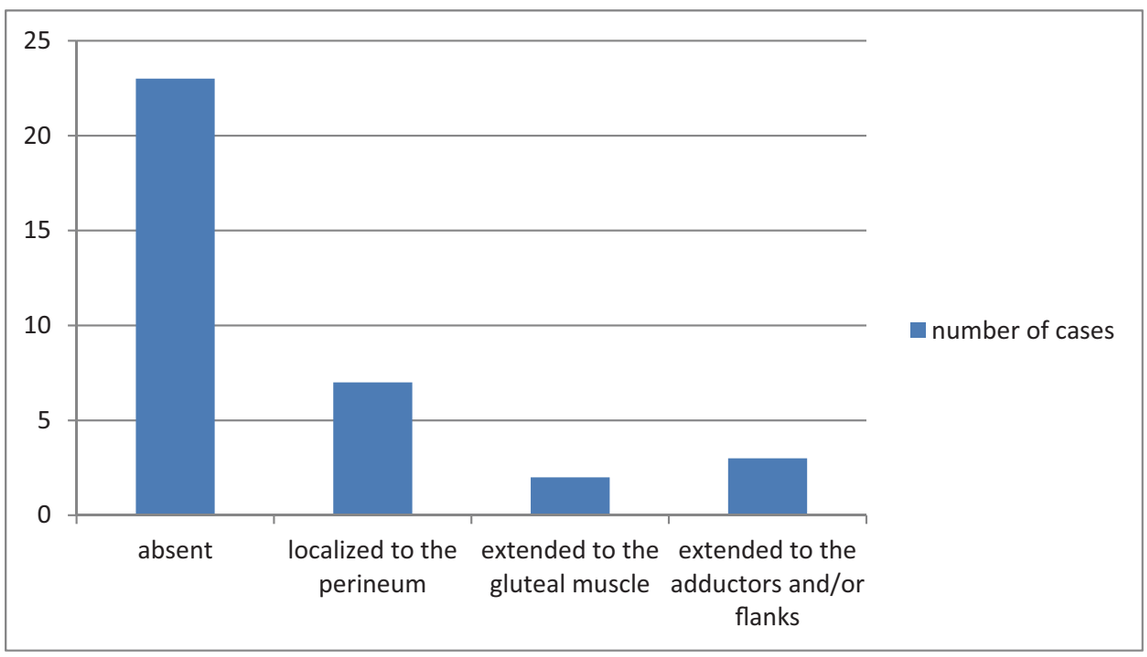

Fig. 2. Extent of myonecrosis

cellulo-fasciitis of perineum and external genitalia. This disease can occur at any age but predominates between 40 and 50. In our series, the average age was 50.3 with predominance in males (71.4%). Apart from diabetes that seems to be the main predisposing condition, other risk factors are involved such as advanced age, alcoholism, immunosuppression and neoplastic diseases [1,2]. Regarding etiologies, the anorectal origin seemed to be the more frequent one: 37% according to Brunet [2] and 42% according to Al Mejjad [3]. This rate rises up to 62.8% in our study. Anorectal origin included fistulas, anal fissures, abscesses of anal margin, sexual injuries, and rectal cancer. Urogenital origin comes in the second place and may consist in a pelvi-perineal trauma, a urethral stricture, or an epididymo-testicular abscess. In our series, only 2 patients had perineal scrotal gangrene because, in most cases, patients are supported in the urology department. Suppurative digestive diseases such as sigmoid diverticulitis, dermatological or iatrogenic origin may be involved. In 5 to 35% cases, gangrene seemed to be primary or idiopathic, without any obvious etiology because of delayed diagnosis or lack of investigation.

Regarding pathophysiology, infection diffuses from the gateway, through the fascia and the cellular spaces to the abdomen, the groin areas, the loins and the thorax. Bacterial growth leads to microvasculitis which leads to healing of the capillary flow causing microthrombosis and necrosis. The extensive cellulo-fasciitis is due to two main facts. On the one hand, the loose texture of fatty tissues facilitates the spread of infection; on the other hand, the perineum is a real anatomical crossroads which communicates with the ischiorectal fossa, the gluteal region, the iliac fossa, the lumbar wall and the anterior abdominal wall. Regarding bacteriology, perineal gangrene is in most cases secondary to a polymicrobial infection involving anaerobic bacteria, gram-negative bacilli and gram-positive cocci. It's considered as a typical model of bacterial synergy [1, 2]. Indeed, aerobic bacteria consume oxygen and create an environment conducive to the growth of anaerobic bacteria. The most frequently isolated germs are: Escherichia coli, Bacteroides fragilis, streptococcus, staphylococcus, Pseudomonas and Clostridium. Sometimes, fungi are involved [4]. These pathogenic organisms are not always isolated. Clinically, the diagnosis is often delayed many days or even weeks in most series including ours (about 13 days on average). It's actually a factor correlated to a poorer prognosis and to a locally advanced disease with erythema, edema, cellulitis, myonecrosis, and general signs of infection such as chills, pyrexia and even septic shock. Crackling is pathognomonic but not mandatory. It was found in 3 patients in our series, 13/31 in El Mejjad's [3]. Imaging may be useful but should not delay the therapeutic management. Radiography can show aeric clarities in the subcutaneous tissues. Ultrasonography shows infiltrated tissues with hyper echoic areas [5, 6]. Computed tomography precises the starting point of the gangrene and assesses its extent in order to adapt surgery [1, 3]. In our series, only one patient had a radiography that showed aeric clarities in the wall. The other patients were examined at an advanced stage thus all additional tests would have been superfluous. Perineal gangrene is a therapeutic emergency. It necessitates a fast and sometimes highly aggressive management. This management comprises [1, 2, 7, 8] intensive care. Antibiotic therapy is systematically introduced and it's based on a broad-spectrum combination against gram-negative, gram-positive and anaerobic germs. It's secondarily adapted to the antibiogram. The more prescribed combination is beta lactam-aminoglycoside-metronidazole (88% in our study). Surgery consists of debridement and excision of damaged tissues up to healthy margins. We advocate, as for most authors, a highly aggressive surgical debridement since the very first

operation, even at the expense of a wide tissue sacrifice. Some authors recommend a more conservative management [9-11]. According to Brunet [2, 8], this open surgery should not leave any focus of infection which could act as a starting point to septic outbreaks. He recommends also a systematic exploration of the ischiorectal fossa. Colostomy is mandatory for some authors [2, 8], optional for others. It's indicated for severe perineal gangrene or when the gateway is proctologic [3, 9]. Colostomy avoids fecal contamination of the wound and facilitates local care and healing. It has two requirements: the colonic segment excluded should be as short as possible, and avoid externalizing the stoma in an area reached by gangrene. In our series, colostomy was performed twice. Despite its benefits described above, it didn't seem to influence the post-operative course for our patients. For Brunet's team, colostomy is systematically performed on the right transverse colon. No additional morbidity is reported when continuity is restored. It should be performed only once the wound heals and after making sure of the continence of the anal sphincter. Iterative excisions in the operating room are quite often necessary, in addition to the initial excision. Transurethral or suprapubic catheterization may be necessary when the gateway is urological but can expose to the diffusion of infection to the bladder and to the upper urinary tract [1]. In our series, 3 patients had suprapubic catheterization and 6 had transurethral catheterization. In the perineal gangrene, testicles and erectile bodies are generally spared. Necrosis of the testicles imposes an orchiectomy and a laparotomy in search of the cause of thrombosis of spermatic vessels [9]. Some clinical studies have shown that Vacuum dressing is particularly effective in the management of large wounds. This was associated with longer hospitalization and lower mortality [12].

Once the systemic septic risk controlled and the wound healed, procedures of secondary covering can be performed using cutaneous, fasciocutaneous and musculocutaneous flaps or approximation suture [1, 13]. Regarding prognosis, perineal gangrene is a serious disease whose mortality ranges from 20 to 50%. This mortality is worsened by delayed therapeutic management, previous debilitating diseases and septic shock. Prognostic factors do vary from a series to another. In ours, the univariate analysis identified many factors which could influence mortality such as the extent of cellulitis, the presence of myonecrosis, the occurrence of a septic shock, the postoperative need for mechanical ventilation and severity scores (SSI II and FGSIS). Diagnosis delay did not seem to be a prognostic factor: 11.8 days for survivors versus 17.2 days for deceased (p=0.15). In other series, advanced age [9], diagnostic and therapeutic delay [2, 3], the extent of myonecrosis [2], FGSIS [10, 11] and SSI II [2], positive culture for streptococcus [1] have been identified as factors correlated to a poor prognosis.

5. Conclusion

Perineal gangrene is an uncommon but life threatening condition with high associated mortality and morbidity. Early diagnosis and aggressive surgical debridement are the main treatment.

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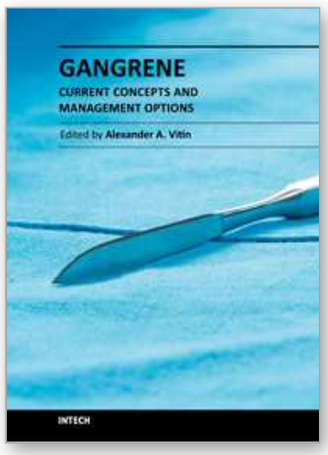

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Gangrene is the term used to describe the necrosis or death of soft tissue due to obstructed circulation, usually followed by decomposition and putrefaction, a serious, potentially fatal complication. The presented book discusses different aspects of this condition, such as etiology, predisposing factors, demography, pathologic anatomy and mechanisms of development, molecular biology, immunology, microbiology and more. A variety of management strategies, including pharmacological treatment options, surgical and non-surgical solutions and auxiliary methods, are also extensively discussed in the bookâ€™s chapters. The purpose of the book is not only to provide a reader with an updated information on the discussed problem, but also to give an opportunity for expert opinions exchange and experience sharing. The book contains a collection of 13 articles, contributed by experts, who have conducted a research in the selected area, and also possesses a vast experience in practical management of gangrene and necrosis of different locations.

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