

Original article:

Role of silver ionic solution with foam dressing in Fournier’s gangrene

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ABSTRACT:

Introduction: Fournier's gangrene (FG) is deadly infection. The wounds commonly show poly-microbial infections with aerobic and anaerobic organism. If FG patient not treated early, can rapidly progress to sepsis with multiple organ failure. Urinary or fecal diversion may be necessary in 5%. Different materials can be used in dressing of wound. Ionic silver is widely used as an antimicrobial, prevent the adhesion of bacteria to surfaces where bio-films can form, contributes to the debridement of the wound and helps to remove slough from the wound surface. We studied this dressing technique for FG which will improve patient compliance, avoid complication and mortality.

Materials and methods: We studied 32 patients diagnosed with Fournier's gangrene without HIV or cancerlike immune-compromised status, between Jan 2016 to Dec- 2016

All dressing is planned to clean with silver ionic solution and foam dressing soaked with silver ionic solution every 3 to 5 days.

Results: Uro-genital system involvement is most common etiological factor for FG (65.25%). Within 3 weeks approximately 35-40% reduction in size of wound. Early recognition and aggressive surgical debridement is the most essential intervention in stopping the rapidly progressing infectious process of Fournier's gangrene.

Key words: Fournier’s gangrene, Ionic silver, Foam dressing.

INTRODUCTION:

Fournier's gangrene is deadly infection. this study is to show early active surgical intervention and silver ionic solution plus foam dressing is best option, cause it required to change dressing every 3-5 days. Silver ions kill bacteria and increase granulation and foam absorb fluid exudates - making wound dry. Most of wound granulated, reduce to 35- 40% of size and get ready to secondary suturing or skin grafting after 3 weeks means 4-5 dressing. Patients follow up to next 6 months on out-patient basis no complication or recurrent infection found in this study.

This method improves patient compliance, avoid complication and mortality.

MATERIALS AND METHODS:

We studied 32 patients diagnosed with Fournier's gangrene with no HIV, non canceror immune-compromised status, between Jan 2016 to Dec-2016. Uludag Fournier's gangrene severity index scores were assessed which includes physical parameters, Dissemination and Age score. Patients were undergone debridement of all dead tissue under spinal anesthesia. The wound fluid and deep tissue send for culture and sensitivity for aerobic and anaerobic organism. As per need repeated debridement of microfilm was done in ward. All dressing were planned to clean with silver ionic solution and foam dressing soaked with silver ionic solution every 3 to 5 days. Most of wound

granulated, and get ready to secondary suturing or skin grafting after 3 weeks means 4-5 dressing. Patients follow up to next 6 months on outpatient basis no complication or recurrent infection found in this study.

RESULTS:

A total of 32 patients of Fournier's gangrene are studied in this study group out of 30 were male patients. 59% of patients are less than 65 yrs age. Alcoholism is most common immune-suppressed condition (43.75%), while 28.13% patients don't have any predisposing factor. All of patients are presented in hospital with more than 48 hrs of their symptoms, commonly rise temperature (65.63%), creatinine(64.38%) and sepsis(65.25%). Uro-genital system involvement is most common etiological factor for FG (65.25%).

All 32 patients were treated with wide surgical debridement under spinal anesthesia and six patients required repeated debridement. The majority of patients received broad-spectrum antibiotic coverage. After surgery, an antibiotics change as per culture sensitivity for 5 days. After 1st dressing, all patients follow up for dressing on OPD basis. Within 3 weeks approximately 35-40% reduction in size of wound. Only two patient required diversion procedure which presented delayed and with anal skin involvement. Seven patients (21.88%) after 3 weeks admitted for secondary closer of wound while rest of 23 patients (71.88%) wound close with slit thickness skin drafting.

Two patients die of delayed presentation with septicemia, which resulted in a mortality rate of 6.25%. Early recognition and aggressive surgical debridement is the most essential intervention in stopping the rapidly progressing infectious process of Fournier's gangrene.

DISCUSSION:

Fournier's gangrene (FG) is a fulminant form of infective necrotizing fasciitis of the perineal, genital, or anorectal regions.¹ FG may be named as idiopathic gangrene of the scrotum, periurethral phlegmon, streptococcal scrotal gangrene and synergistic necrotizing cellulitis. FG mostly predisposed immunocompromised patient by diabetes mellitus, chronic alcoholic or HIV.² The wounds commonly show poly-microbial infections with aerobic and anaerobic organism. The synergistic activity of aerobes and anaerobes lead to the production of various exotoxins and enzymes which lead to tissue destruction, microvascular thrombosis of the small subcutaneous vessels and dermal necrosis.³ If FG patient not treated early, can rapidly progress to sepsis with multiple organ failure.⁴ The spread of infection is along the facial planes and is usually limited by the attachment of the Colles' fascia in the perineum but can spread up the anterior abdominal wall.⁵ Tuncel study of FG demonstrated no association between FGSI and mortality, and stated that specific metabolic parameters (serum albumin and alkaline phosphatase), predisposing factors and disease extent should be assessed together to predict treatment outcome and survival.⁶

Different materials can be used in dressing of wound. Honey has a low pH of 3.6 and contains enzymes which digest necrotic tissues it also has antibacterial property due to phenolic acid. Ionic silver is widely regarded as an antimicrobial, prevent the adhesion of bacteria to surfaces where bio-films can form, contributes to the debridement of the wound and helps to remove slough from the wound surface.⁷

Enzymatic debridement with lyophilized collagenase application are other local treatment that have been shown to be beneficial.⁸

Use of fibrin glue has recently been suggested in skin defects with no active infection.⁹ Vacuum assisted closure (VAC) system dressing works by exposing a wound to sub-atmospheric pressure for an extended period to promote debridement and healing.¹⁰

Most reconstructive techniques provide reliable coverage and protection of testicular function with an acceptable cosmetic result. There is no conclusive evidence to support flap coverage of exposed testes rather than skin graft. A reconstructive algorithm is proposed.¹¹ Urinary or faecal diversion may be necessary depending upon the foci of origin of the disease is 5%.^{12,13}

CONCLUSIONS:

The Fournier's gangrene severity index remains an objective and simple method to quantify the extent of metabolic aberration at presentation in patients with Fournier's gangrene. A Fournier's gangrene surgical debridement and silver ionic solution with sterile foam is best cost effective with improve patients compliance, avoid complication and mortality.

Table I: Variables in FG patients

Variables	No. Of Patient
Age (years)	
<65	19 (59.38%)
≥65	13 (40.62%)
Sex:	
Male	30 (93.75%)
Female	02 (06.25%)
No of Debridement	
<2	26 (81.25%)
≥2	06 (18.75%)
Diversion	
Performed	02 (06.25%)
Not performed	30(93.75%)
Wound closer	
Second	07(21.88%)
Tertiary	23(71.88%)

Table II: Etiology of FG

Etiology	Male	Female	Total
Perineal	06	--	06 (18.75%)
Urinary-Genital (Labia/Scrotum)	17	01	18 (56.25%)
Ano-rectal	03	01	04(12.50%)
Combine	04	--	04 (12.50%)

FGSI Factors	No. of Patient	Mann-Whitney ‘U’ Test
Temperature (> 100⁰C)	21 (65.63%)	P<0.5 Significant
Heart rate	27 (84.38%)	P<0.5 Significant
Respiratory rate	18 (56.25%)	
Sr. Na ⁺	13 (40.63%)	
Sr. K ⁺	12 (37.50%)	
Sr.Creatinin (> 2gm %)	26 (81.25%)	P<0.5 Significant
PCV		
WBC count (> 10,000/mm ³)	31 (96.88%)	
Sr. Bicarbonate	12 (37.50%)	
Sepsis	18 (65.25%)	P<0.5 Significant
Gangrene confine to pelvic	29 (90.63%)	
Gangrene extend beyond pelvic	03(09.38%)	
Predisposing factor:		
DM	08(25.00%)	P<0.5 Significant
Alcoholism	14 (43.75%)	
HIV	01 (03.13%)	
No predisposing	09 (28.13%)	
Mortality	02 (06.25%)	P<0.5 Significant
Both patients having FGSI	>9	
Fournier’s gangrene severity index:(FGSI)		
≤9		
>9	06 (18.75%)	

26	(81.25%)
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Table III:UludagSeverity Index in Fournier’s Gangrene

		
Perineal FG Clinical Presentation	Debridement	Wound healing with silver ionic solution with foam

Photo I:Perinal FG

		
Scrotal FG	Debridement	Secondary STSG

Photo II:Urogenital FG

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