



STUDY ON BENEFITS OF EARLY FASCIOTOMY IN PATIENTS WITH CELLULITIS IN KAPV MEDICAL COLLEGE ,TRICHY : A DESCRIPTIVE STUDY

General Surgery

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ABSTRACT

INRODUCTION: Cellulitis is a frequent bacterial infection of the skin and subcutaneous tissues, characterised by an area of cutaneous erythema, warmth and oedema, whose incidence is rising, and that results in substantial economic and healthcare burdens. one of the definitive treatment to prevent complications in cellulitis is fasciotomy. In this study benefits of early fasciotomy was studied by using various clinical parameters

MATERIALS AND METHODS: a descriptive study which carried out in 100 patients who were admitted in KAPV medical college hospital during one year study period. patients age less than 20 years of age, unstable patients, moribund patients, those not willing to participate in study are excluded from study. Detailed history and clinical examination done for all patients who were admitted in patients with cellulitis Patient who underwent fasciotomy less than 12 hours of admission classified as early and who underwent fasciotomy after 12 hours of admission classified as late. The various clinical presentations and its complications of patients with cellulitis underwent fasciotomy was studied.

RESULTS: In our study in total number of 100 patients ,7.7% of patients gets progressed in to severity and complications in early fasciotomy procedure and 60.0% of patients progressed into complications in late fasciotomy .Mean duration of hospital stay in early fasciotomy is 5.6 days and 8.1 days in late fasciotomy .patients mobilized very early and the mean quality of life scale is satisfactory in early fasciotomy which was late and average respectively in late fasciotomy procedure. when compared to early fasciotomy morbidity status was increased in late fasciotomy.

CONCLUSION: Early fasciotomy is associated with improved outcomes in reducing the progression rate, early mobilization, reduced hospital stay, improves quality of life and reduces the morbidity.

KEYWORDS

Compartment syndrome; Fasciotomy; Early Fasciotomy, Late fasciotomy

INTRODUCTION:

one of commonest problem noted in our general wards is cellulitis. there are no effective diagnostic modalities and many clinical conditions appear similar. if left untreated it results in unwanted complications like acute compartment syndrome ,local destruction (gangrene), vascular compromise, septicemia and death. so we planed to study on early fasciotomy in cellulitis patients and its outcome. cellulitis is a non suppurative invasive infection of tissues involving subcutaneous and fascial planes. infection may follow a small scratch or wound or incision or insect/snake/scorpion bite. it is typically caused by organisms such as beta hemolytic streptococci, staphylococci and c. perfringens. tissue destruction, gangrene, ulceration may follow which are caused by release of protease. commonly seen in diabetic and immunocompromised states and old aged people. common in face, upper limb, lower limb, scrotum. higher antibiotics , limb elevation. glycerine dressing , bandaging and fasciotomy play a role. fasciotomy is a surgical procedure where fascia is cut to relieve tension or pressure commonly to treat resulting loss of circulation to an area of tissue or muscle.

METHODOLOGY:

A descriptive study was carried out in the department of general surgery, kapv medical college and mgm government hospital, trichy from february 2018 to february 2019 among cellulitis patients aged more than 20 years. patients age less than 20 years of age, unstable patients, moribund patients, those not willing to participate in study were excluded from study. Informed consent was obtained from patients. Detailed history and clinical examination done for all patients who were admitted with cellulitis. Patients were divided into two groups based on whether the fasciotomy procedure was performed early or late. Patient who underwent fasciotomy less than 12 hours of admission classified as early and who underwent fasciotomy after 12 hours of admission classified as late. The various clinical presentations and its complications were studied in patients with cellulitis who underwent early/late fasciotomy. the outcome of patients who

underwent early/late fasciotomy compared by using various clinical parameters which includes disease progression, duration of hospital stay, early mobilization, morbidity, mean quality of life index.

OBSERVATION AND RESULTS

OBSERVATION

AGE

The patient with age more than 20 years are chosen. The lowest age was 38 years and highest age was 87 years. The distribution of cases is shown in the table below, the highest incidence was noted in 50-60 age group with 39%. The lowest incidence 20-30 age group with 0%

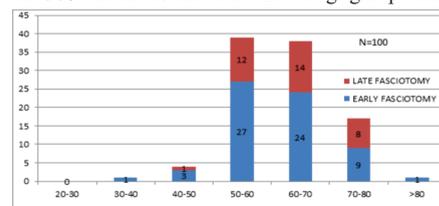


Figure 1-various Age Groups Of Patients Underwent Fasciotomy

GENDER

The male show dominance among patient with incidence of 93 among 100, female form minority with rest 7 patients.

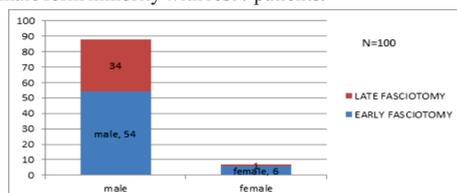


Figure 2-gender Of Patients Underwent Fasciotomy

ASSOCIATED PREDISPOSING FACTORS

Most common predisposing factors which was present in my patient was diabetes and snake bite which includes 35 patients each, followed by trauma and CKD which includes 15 patients each.

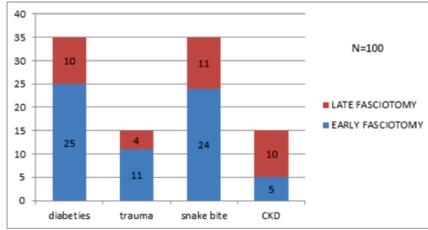


Figure 3-common Predisposing Factors In Patiets Presenting With Cellulitis

EARLY Vs LATE FASCIOTOMY

out of 100 patients early fasciotomy done in 65 patients, in which 62 patients showed good outcome and only 3 patients end up with complications and severity. Late fasciotomy done in 35 patients, in which 12 patients showed good outcome, rest 23 patients end up in complications.

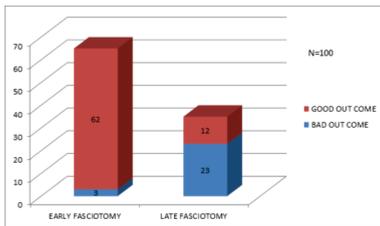


Figure 1-comparison Between Outcome Of Patients Underwent Early/late Fasciotomy

RESULTS:

	EARLY FASCIOTOMY (N=65)	LATE FASCIOTOMY (N=35)	p-VALUE
1 PROGRESSION OF DISEASE	7.7%	60.0%	0.000 (<0.005)
2 DURATION OF HOSPITAL STAY	5.6 days	8.1 days	0.000 (<0.005)
3 EARLY MOBILISATION(mean duration)	26.2 hours	55.5 hours	0.000 (<0.005)
4 MORBIDITY	Less(6.2%)	More(31.4)	0.002 (<0.005)
5 MEAN QUALITY OF LIFE SCALE** 3rd POD*(mean score)	6.9	4.7	0.000 (<0.005)

*POD-Post operative day

**According to American chronic pain association

Progression of disease includes development of complications such as gangrene, septicemia, necrotizing fasciitis, compartment syndrome, acute kidney injury. duration of hospital stay includes exact number of days patient stayed in hospital due to cellulitis or its complications, early mobilization includes ambulation of patients after fasciotomy, morbidity includes loss of part of limb, mean quality of life measured by using American chronic pain association mean quality of life scale.

Quality Of Life Scale

0	Stay in bed all day Feel hopeless and helpless about life
1	Stay in bed at least half the day Have no contact with outside world
2	Get out of bed but don't get dressed Stay at home all day
3	Get dressed in the morning Minimal activities at home Contact with friends via phone, email
4	Struggle but fulfill daily home responsibilities No outside activity Not able to work/volunteer
5	Do simple chores around the house Minimal activities outside of home two days a week
6	Work/volunteer limited hours Take part in limited social activities on weekends

7	Work/volunteer for a few hours daily. Can be active at least five hours a day. Can make plans to do simple activities on weekends
8	Work/volunteer for at least six hours daily Have energy to make plans for one evening social activity during the week Active on weekends
9	Work/volunteer/be active eight hours daily Take part in family life Outside social activities limited
10	Go to work/volunteer each day Normal daily activities each day Have a social life outside of work Take an active part in family life

Among the 128 patients who were admitted in MGM medical college hospital for cellulitis treatment, After applying the inclusion and exclusion criteria the

total sample size was 100. Overall patients in the sample were predominantly male. There was no significant clinical outcome difference in mean age (p-value >0.005) and gender (p-value >0.005). On statistical analysis, there was significant difference in disease progression (p-value 0.000), 7.7% of patients gets progressed in to severity and complications in early fasciotomy procedure and 60.0% of patients progressed into complications in late fasciotomy. There was significant difference in Mean duration of hospital stay (p-value 0.000), mean duration of hospital stay in patients underwent early fasciotomy is 5.6 days and 8.1 days in late fasciotomy. There was significant difference in patient mobilization after procedure (p-value 0.000), patients mobilized very early (26.2 hours) and there was significant difference (p-value 0.000) in mean quality of life scale which was satisfactory in early fasciotomy (6.9), patient mobilization and mean quality of life index was late (6.9) and average (4.7) respectively in late fasciotomy procedure. When compared to early fasciotomy morbidity status was increased in late fasciotomy, statistical analysis shows significant difference (p-value 0.002).

DISCUSSION

Cellulitis is a frequent bacterial infection of the skin and subcutaneous tissues, characterised by an area of cutaneous erythema, warmth and oedema, whose incidence is rising, and that results in substantial economic and healthcare burdens. In fact, although mild cellulitis can be managed in the ambulatory setting by family doctors, more serious cases represent a common and progressively increasing cause of hospital admissions, particularly among the elderly and individuals with predisposing factors or comorbidities.

In the hospital setting, patients are usually treated with intravenous (IV) antibiotics for 5–7 days, although IV or oral therapy may be prolonged up to 14 days or longer in immunosuppressed or in complex cases, depending on the response. The causative microorganism is not identified in most cases of cellulitis, but *Streptococcus pyogenes*, other streptococci and *Staphylococcus aureus* account for about three-fourths of those cases in which an agent is recovered, although the relative proportion may differ depending on the type cellulitis and the individual characteristics of the patients. The infection can cause significant local tissue damage, and can spread systemically via the lymphatic system and bloodstream. However, cellulitis management may be complicated if it is caused by certain agents, such as methicillin-resistant *S. aureus* (MRSA), a difficult-to-treat and potentially deadly microorganism requiring specific antimicrobials for its cure. Furthermore, healthcare costs are increased because of frequent hospital readmissions due to the high recurrence rate of cellulitis, which is favored by diverse local and systemic factors. Guidelines for treating specific infectious diseases often emphasize the need to determine the microbial etiology of the invading pathogen(s) to plan the most effective antimicrobial therapy. In cases of cellulitis, diagnosis and management largely depend on the morphological features of the lesion and the clinical setting; the causal pathogen is less important, however definitive treatment for cellulitis is fasciotomy.

Fasciotomy is a clinical procedure indicated once the clinical diagnosis of compartment syndrome is made.

Compartment syndrome results from the combination of increased interstitial tissue pressure and the noncompliant nature of the fascia and osseous structures that make up a fascial compartment. Severe complications following compartment syndrome were first described in 1881 by Richard Van Volkmann after he noted that interruption of

the blood supply to the flexors in the forearm secondary to supracondylar fractures resulted in paralysis and contracture of the affected muscle group

A fasciotomy consists of one or more fascial incisions and remains the only effective way to treat acute compartment syndrome.

The importance of timely evaluation and clinical suspicion is based on the sequelae of compartment syndrome. Nerve conduction can be negatively affected after 2 hours of ischemia; however, if compartment syndrome is diagnosed and treated within 6 hours of onset, overall functional impairment is unlikely.

Fascial compartments are defined by unforgiving connective-tissue septa and osseous structures. Without sufficient compliance of these structures, pressure increases within the closed system, causing microvascular compromise and subsequent muscle and nerve ischemia.

Compartments that have the least baseline compliance are those that are most likely to develop compartment syndrome. This is the case for the anterior and deep posterior compartments of the leg. Although it most commonly (40%) occurs in the compartments at the level of the tibia and fibula, compartment syndrome is seen anywhere muscle groups are enclosed as described above, including the buttocks and lumbar paraspinal muscles.¹

Diagnosis of compartment syndrome can be made by clinical examination or with more objective measures such as compartment pressures. Although absolute compartmental pressures are often used for fasciotomy decision making, the difference between the compartment pressure and diastolic pressure (Δp), has been associated with an increased accuracy in diagnosing compartment syndrome and is particularly useful in the multitrauma patient. Multitrauma patients can become hypotensive and therefore create an environment in which the development of compartment syndrome can occur at lower pressures and confound diagnosis of compartment syndrome in these clinical scenarios.⁶ A high clinical suspicion for compartment syndrome along with serial examinations without the use of compartment pressure measurements is still used in many settings today.

Indications for surgical intervention in acute compartment syndrome in the alert patient are generally based on clinical impression. Four signs and symptoms are commonly referred to as the four *Ps*, as follows:

- Pain that is out of proportion to clinical findings
- Pain with passive stretch of involved muscles
- Pain with palpation of involved compartment
- Pressure increase within the compartment as measured

Certainly, all of these signs do not need to be and are often not present in the setting of acute compartment syndrome. A pulseless extremity more likely reflects large vessel injury as a very late finding in compartment syndrome and may not develop at all despite protracted elevated pressures.

In a patient who cannot express pain or paresthesias, serial clinical examinations along with monitoring of compartment pressure can play a more important role in the diagnosis.

The pressure point at which fasciotomy should be considered is not a specific value, although a compartment pressure of 30 mm Hg is a commonly cited value. Masquelet notes that whenever diastolic pressure minus tissue pressure (Δp) is less than 30 mm Hg, fasciotomy is indicated.

In this study early and late fasciotomy compared by using various clinical indicators.

CONCLUSION:

Early fasciotomy is associated with improved outcomes in reducing the progression rate, early mobilization, reduced hospital stay, improves quality of life and reduces the morbidity. Hence early fasciotomy has better than late fasciotomy in patients presented with cellulitis with or without co-morbidities.

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