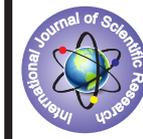


## Role of faciotomy and lymphedema in the management of bacterial cellulitis/lymphangitis - one year observational study



### General Surgery

**KEYWORDS:** lymphangitis; fasciotomy; lymphedema.

**Dr. S. Sivaprasad**

MBBS, MS, FICS Associate Professor of Surgery, Govt Medical College, Trivandrum

**Dr. Jayan Stephen**

MBBS, DNB (Surg), FCIP, FMAS, FIAGES, MNAMS, FICS Associate Professor of Surgery, Govt Medical College, Trivandrum

**Dr. R Parameswaran Unnithan**

MBBS, MS, Professor of Surgery, Govt Medical College, Trivandrum

**Dr. Musafir**

Junior Resident, Govt Medical College, Trivandrum

### ABSTRACT

An observational study to look for the incidence of lymphedema in patients undergoing fasciotomy for cellulitis/lymphangitis and patients undergoing conservative management for the same. Here patients are followed up for about six months to look for persistent lymphedema. Study Subjects includes 83 patients undergoing fasciotomy for cellulitis/lymphangitis and Patients undergoing conservative management for cellulitis/lymphangitis. A semistructured questionnaire was developed to record the medical history and examination details. Among the 40 patients who underwent fasciotomy for cellulitis/lymphangitis, 7 patients [17.5%] developed persistent lymphedema at the end of 6 months and Among the 43 patients who underwent conservative management for cellulitis/lymphangitis, 17 patients [39.5%] developed persistent lymphedema at the end of 6 months. Out of 83 patients in this study, 6 patients [7.2%] developed non healing ulcer. Among the 40 patients who underwent fasciotomy, 6 patients [15%] developed non healing ulcer by the end of 6 months.

### Introduction

Cellulitis is a relatively common infection of the skin and subcutaneous tissue associated with high morbidity and a burden on healthcare resources. Lymphoedema the accumulation of fluid in interstitial spaces can occur as a consequence of cellulitis. Similarly, the presence of chronic lymphoedema can predispose to recurrent episodes of cellulitis.

Various risk factors have been shown to be associated with cellulitis, with lymphoedema showing the strongest association (Dupuy et al, 1999). This is particularly the case in recurrent cellulitis. Streptococcal cellulitis associated with lymphoedema can be aggressive with severe symptoms and morbidity (Bonnetblanc and Bedane, 2003 Lymphangitis is defined as an inflammation of the lymphatic channels that occurs as a result of infection at a site distal to the channel. Secondary lymphedema is much more common than primary lymphedema and is caused by damage to the lymphatic transport capacity, e.g., by infection, trauma, surgery, radiotherapy or a combination of these. The lower leg is the most affected site, accounting for 75–90% of all cases.

Although lymphedema remains incurable, treatment is possible and can significantly improve symptoms and quality of life. The principle of treatment is to improve, through stimulating interventions, lymph flow within existing or collateral drainage routes.

Therapy for typical cases of cellulitis should include an antibiotic active against streptococci. A large percentage of patients can receive oral medications from the start for typical Cellulitis, and suitable antibiotics for most patients include penicillin, amoxicillin, amoxicillin-clavulanate, dicloxacillin, cephalexin, or clindamycin. In cases of uncomplicated cellulitis, a 5-day course of antimicrobial therapy is as effective as a 10-day course, if clinical improvement has occurred by 5 days. In a retrospective study of cellulitis and abscesses requiring hospitalization, the average duration of treatment was 2 weeks and only about one-third of patients received specific treatment for gram positive pathogens. Two-thirds received very-broad-spectrum treatment, and the failure rate of 12% was not different regardless of spectrum of treatment. In some patients, cutaneous inflammation and systemic features worsen after initiating therapy, probably because sudden destruction of the pathogens releases potent enzymes that increase local inflammation.

A lot of patients come to our outpatient department with persistent lymphedema following an attack of cellulitis/lymphangitis. Many of the patients undergo conservative management with antibiotics analgesics and supportive measures. Some patients undergo fasciotomy for the same. No elaborative studies have been done previously to identify the reason and incidence of persistent lymphedema following an attack of cellulitis/lymphangitis.

Objectives of this observational study is to look for the incidence of persistent lymphedema in patients undergoing fasciotomy for cellulitis/lymphangitis and patients undergoing conservative management for the same. Here patients are followed up for about 6 months to look for persistent lymphedema.

The most important element of lymphedema management is ensuring patients obtain an understanding of their condition and what they can do to help themselves. Patient motivation and compliance is central to a successful treatment regimen, especially when employing physical treatment modalities. Hence it is important to identify early lymphedema and start management.

### Materials and Methods

This is a study to look for the incidence of lymphedema in patients undergoing fasciotomy for cellulitis/lymphangitis and patients undergoing conservative management for the same. Here patients are followed up for about 6 months to look for persistent lymphedema. Study Subjects includes patients undergoing fasciotomy for cellulitis/lymphangitis and Patients undergoing conservative management for cellulitis/lymphangitis. A semistructured questionnaire was developed to record the medical history and examination details. Patients fulfilling the inclusion criteria were enrolled into the study and evaluation and recording after getting a written informed consent. Assessment of the lower extremities begins with a visual inspection of the legs. Color, presence of hair, visible veins, size of the legs, ulcerations, lack of hair should be noted. If swelling is observed, the calf circumference should be measured with a tape measure. This measurement can be compared to future measurements to see if the swelling is getting better. Determine if elevating the legs makes the swelling go away. Pressure should be applied with the fingertips over the ankle to determine the degree of swelling. The assessment should also include a check of the popliteal, femoral, and posterior tibial, and dorsalis

pedis pulses. When checking the femoral pulse, feel for the inguinal nodes and determine if they are enlarged. All patients undergoing treatment for cellulitis/lymphangitis for a period of 1 year in the department of general surgery. Sample size could not be measured since no studies have been done previously to look for the incidence of lymphedema following fasciotomy for cellulitis of lower limb.

**Results**

Out of 83 patients in this study 43 patients undergo conservative management for cellulitis/lymphangitis and 40 patients undergo fasciotomy for the same. Majority of patients in this study group belongs to urban 51.8% and patients belongs to rural place were 48.2%. Among the 40 patients who underwent fasciotomy for cellulitis/lymphangitis 25 are males, 62.5% and 15 are females, 37.5%. Among the 43 patients who underwent conservative management for cellulitis/lymphangitis, 23 are males [53.5%] and 20 are females [46.5%]. Out of total 83 patients in these study 24 patients [28.9%] developed persistent lymphoedema following cellulitis. Among the 40 patients who underwent fasciotomy for cellulitis/lymphangitis, 7 patients [17.5%] developed persistent lymphedema at the end of 6 months and Among the 43 patients who underwent conservative management for cellulitis/lymphangitis, 17 patients [39.5%] developed persistent lymphedema at the end of 6 months. Out of 83 patients in this study, 6 patients [7.2%] developed non healing ulcer. Among the 40 patients who underwent fasciotomy, 6 patients [15%] developed non healing ulcer by the end of 6 months.

Out of 83 patients in this study, 2 patients [2.4%] developed loss of distal pulsations. Among the total 40 patients who underwent fasciotomy, 2 patients [5%] had absent distal pulse after the study period. Out of 83 patients in this study, 2 patients [2.4%] developed distal neurological deficit. Among the total 40 patients who underwent fasciotomy, 2 patients [5%] had distal neurological deficits at the end of 6 months. Out of 83 patients in this study, 12 patients [14.5%] developed recurrent cellulitis.

**a. Frequency and percentage distribution of subjects with recurrent cellulitis versus treatment modalities.**

| Cross table: RECURRENT CELLULITIS versus TREATMENT |         |                                      |            |              |        |
|--|---------|--------------------------------------|------------|--------------|--------|
|  |         |                                      | TREATMENT  |              | Total  |
|  |         |                                      | fasciotomy | conservative |        |
| RECCUR<br>CELLULITIS                               | absent  | Count                                | 34         | 37           | 71     |
|  |         | % within RECCUR<br>ENT<br>CELLULITIS | 47.9%      | 52.1%        | 100.0% |
|  | present | Count                                | 6          | 6            | 12     |
|  |         | % within RECCUR<br>ENT<br>CELLULITIS | 50.0%      | 50.0%        | 100.0% |
| Total  |         | Count                                | 40         | 43           | 83     |
|  |         | % within RECCUR<br>ENT<br>CELLULITIS | 48.2%      | 51.8%        | 100.0% |

Among the 40 patients who underwent fasciotomy for cellulitis/lymphangitis, 6 patients [15.0%] developed recurrent cellulitis in 6 months and Among the 43 patients who underwent conservative management for cellulitis/lymphangitis, 6 patients [14.0%] developed recurrent cellulitis.

**Discussion**

Cellulitis and lymphangitis are relatively common infections of the

skin and subcutaneous tissue associated with high morbidity and a burden on healthcare resources. Lymphoedema is the accumulation of fluid in interstitial spaces and can occur as a consequence of cellulitis. Similarly, the presence of chronic lymphedema can predispose to recurrent episodes of cellulitis. A lot of patients come to our outpatient department with persistent lymphedema following an attack of cellulitis/lymphangitis. Many of the patients undergo conservative management with antibiotics analgesics and supportive measures. Some patients undergo fasciotomy for the same. No elaborative studies have been done previously to identify the reason and incidence of persistent lymphedema following an attack of cellulitis /lymphangitis.

These studies included a total of 83 patients and were observed in two groups, patients undergoing conservative management for culture proven bacterial cellulitis/lymphangitis and patients undergoing fasciotomy for severe cellulitis with risk of compartment syndrome. Patients were followed up for 6 months and the incidence of persistent lymphedema following fasciotomy for cellulitis/lymphangitis and conservative management of same are measured. Long term outcomes of management of cellulitis/lymphangitis were also noted.

Fascial compartments are defined by unforgiving connective tissue septa and osseous structures. Without sufficient compliance of these structures as in cellulitis, pressure increases within the closed system causing microvascular compromise and subsequent muscle and nerve ischemia. Fasciotomy for severe cellulitis would be more effective in alleviating pain and symptoms in the long-term.

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