

Original article

Collar button abscess complicated with volar extension in diabetic industrial workers of pune: a tertiary centre based study

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ABSTRACT

Background: Diabetes-related hand infections are less known and identified than foot-related infections, which typically cause delayed diagnosis and serious mortality & morbidity in patients with poorly managed diabetes.

Aim and Objective: To diagnose and provide immediate surgical treatment for collar button abscesses in diabetic industrial workers.

Material and Methods: A retrospective observational study was conducted on 50 patients in the department of surgery over a period of two years from July 2020 to June 2022.

Results: Highest incidence was seen in the age group of 50–60 with 23.8% patients. Males were found to be affected more than females to an extent of 72.38%. Patients presented most commonly with pain and swelling together. The inciting trauma in all patients was trauma at workplace and all were diabetics. Staphylococcus aureus was the most common organism cultured followed by streptococcus and mixed cultures of staphylococcus and streptococcus. There was a rise in number of cases soon after the monsoon starts in June which gradually decreases and again there was a rise from November to January with maximum cases in December.

Conclusion: The most frequent cause of continuous dorsal spread in collar button abscesses is an infected palmar injury. Early detection of collar-button abscesses is crucial because it informs the choice to make 2 incisions, one on the dorsal as well as another on the volar part of the hand, preventing incomplete abscess evacuation and the need for reoperation.

Keywords: Collar Button Abscess, Volar Extension, Diabetes

INTRODUCTION

In the pre-antibiotic period, 65% of hand impairments were brought on by minor wounds that became an infection. Hand deformities were produced by a 50% to 75% infection. The 5 fascial spaces of the hand—the thenar, middle Palmer, hypothenar, dorsal subaponeurotic, and dorsal subcutaneous as well as their communication patterns were identified by Kanavel in this classic and therapeutically significant work. Additionally, he observed that purulence spreads in predictable patterns as it builds up and pressure rises in these small areas. As a result, Kanavel was able to create the surgical method that serves as the basis for current hand infection management.¹ There are still

many incisions in use today. Diabetes-related hand infections are less known and identified than foot-related infections, which typically cause delayed diagnosis and serious mortality & morbidity in patients with poorly managed diabetes.² A web space infection that affects both the palmar & dorsal hands might lead to complications like a collar-button abscess. Since the diagnosis is clinical, concern must be indicated if an abscess arises in the gaps between neighboring fingers at the distal border of the palm. Group A Streptococcus and Staphylococcus aureus are the most prevalent infectious agents, with “S. aureus” being found in 80 percent of samples.³ It's important to choose the right surgical procedure to treat a collar button abscess.

MATERIAL & METHODS

A retrospective observational study was conducted on 50 patients in the department of surgery over a period of two years from July 2020 to June 2022 after obtaining Institutional Ethics Committee approval. Age range varied from youngest being 30 years of age to oldest being 72 years old.

Medical records of Diabetic (with HbA1C >7, and on OHA) patients working in industrial zones of Pimpri Chinchwad, Pune who presented with Hand infections, excluding post-surgical illnesses treated with incision & debridement during 2 years were studied. Past medical history, Patient demographics; infection site and cause; surgical intervention; gram cultures and stains, difficulties, and consequences were evaluated. All the patients were studied and clinical findings were noted as per proforma of the case sheet. Necessary examinations were done and patients were assessed for predisposing variables, precipitating events, and complications. Presenting complaints and the inciting event was noted. All the patients were investigated for several parameters

Investigations done included viz. hemoglobin, total count and differential count, fasting and post-prandial blood sugars, lipid profile, HbA1c, serum creatinine, and blood urea, radiograph of the affected hand, and culture and sensitivity of the debrided tissue. All patients were taken up for surgery where surgical debridement was done and

was later managed in the ward with regular dressings and debridement was done as per need arose

Diabetic patients were managed by sugar restriction, a diabetic diet, and short and long-acting insulin. Blood sugars were monitored, and insulin was given according to a sliding scale initially once patients' glycemic status was regularized patients were shifted to injectable insulin on a fixed dose or oral hypoglycaemics. All the patients' cultures were followed up and antibiotics were changed accordingly. Patients with healthy wounds and healthy granulation tissue were grafted with skin grafts. Some patients were taken up for secondary suturing while some of the patient's wounds healed by secondary intention. Present study evaluated the modes of presentation, predisposing events, management of in patients with dressings and debridement, association with comorbid conditions, and their effect on general management, the complications, and their management were assessed and analyzed.

RESULTS:

Age wise distribution of the patient population was assessed. Highest incidence was seen in the age group of 50–60 with 23.8% patients belonging to this age group. The oldest patient was 72 years and youngest was 22 years old and all were diabetics. Males were found to be affected more than females to an extent of 72.38% (Table 1).

Table 1 Sex Ratio

GENDER	NO. OF PATIENTS	PERCENTAGE
MALE	38	72.38
FEMALE	12	27.62

PRESENTATION:

Patients presented most commonly with pain and swelling together. Next common presentation was pain, swelling and discharge. Other common

presentations were pain, swelling and fever. The inciting trauma in In all patients was trauma at workplace and all were diabetics (Table 2).

Table 2 Presenting symptoms

PRESENTATION	NO. OF PATIENTS	PERCENTAGE
PAIN AND SWELLING	18	36.1
PAIN, SWELLING AND DISCHARGE	18	37.1
PAIN, SWELLING AND FEVER	10	20
BLACK PATCH AND PAIN	2	2.8
ULCER WITH DISCHARGE	1	1.9
DISCHARGE AND SWELLING	1	0.9
DISCHARGE	1	0.9

Organisms cultured

Organisms cultured: Staphylococcus aureus was the most common organism cultured. The next most

common organism cultured was streptococcus followed by a mixed cultures of staphylococcus and streptococcus.

Table 3 Organisms cultured

ORGANISMS CULTURED	NO. OF PATIENTS	PERCENTAGE
STAPHYLOCOCCUS	40	80
STAPHYLOCOCCUS AND STREPTOCOCCUS	6	11.4
STREPTOCOCCUS	1	2
NUMEROUS ORGANISMS	3	6

Seasonal variation

There is rise in number of cases soon after the monsoon starts in June which gradually decreases

and again there was a rise from November to January with maximum cases in December.

Table 4 Seasonal variation

Month	Number of patients	Percentage(%)
January	5	10
February	2	4
March	2	4
April	4	8
May	3	6
June	6	12
July	5	10
August	4	8
September	4	8
October	3	6
November	7	14
December	5	10

DISCUSSION

A subfascial infection of a web area that tends to become larger at the dorsal and palmar ends but gets smaller in the center is referred to as a "collar-button abscess".⁴ The abscess has an "hourglass" shape, as the name suggests. It frequently occurs as a direct inoculation reaction or incidentally from nearby anatomical structures.⁵ The clinical detection is based on the abscess that has formed at the palm's distal margin, splitting the neighboring fingers.

The illness has the propensity to spread dorsally via the gap in the palmar fascia to affect the "subcutaneous tissue" of the dorsal web because of the stiffness of the palmar aponeurosis and the adhesion of the palmar skin and underlying fascia. The interosseous muscles, hypothenar septum, and ulnar three-digit flexor tendons serve as the mid-palmar space's boundaries. The presenting symptoms of our patient are compatible with an abscess in this area, which will cause pain when the middle & ring fingers are moved. The infection spreads via the "superficial transverse metacarpal" ligament between the metacarpals, from the "palmar fascia", to the dorsal subcutaneous area. The implicated web space swells and inflames as the infection moves dorsally via the fascial hole, which causes the abduction of nearby digits.

Diabetics are more likely than non-diabetics to get deep-space hand infections. AGES ("Advanced Glycated End-Products") and "microangiopathy" of the distal extremities are assumed to be involved in the pathogenesis, albeit this has not been thoroughly explored. Diabetes causes alterations in the hands'

connective tissues in a large number of people (Figure 1). Increased tissue glycation may lead to less collagen degradation, which could predispose to the fascia in the hand weakening and contracting. The vulnerability to virus dissemination and communication between facial areas rises with facial deterioration. Due to their immunocompromised state, reduced perfusion, and diminished nerve function, diabetes patients are also more susceptible to infection and have a slower tendency to heal.

The symptoms of a collar button abscess might resemble those of cellulitis and suppurative diseases. Initial diagnoses for some of the patient's ailments included cellulitis and fourth-digit tenosynovitis. The four cardinal indications of flexor tendon sheath infections, according to Kanavel, are symmetrical swelling of the whole digit, discomfort with the passive extension digit, semiflexed digit placement, and tenderness throughout the flexor tendon sheath's course. Some patients first raised concerns about flexor tenosynovitis and cellulitis due to the presence of two of the four Kanavel symptoms, and the absence of pain along the full course of the 4th flexor tendon sheath with fusiform swelling. In cases similar to this one in the future, it is crucial to consider deep-space abscesses because clinical & laboratory signs are frequently inconsistently present. Delayed surgical intervention led to permanent defects with restricted movement of the palm and hence poor quality of life. Effective "collar button abscess" decompression needs both volar & dorsal incisions owing to connecting route between the dorsal & volar hands.



Fig 1) Diabetic Hand

There are many different incision patterns, but two incisions should be made during treatment: a longitudinal incision between digits and a volar “Z-pattern” incision on the dorsal hand.^{6,7} These incisions should extend from the distal palmar crease to the proximal border of the web to prevent the common digital bundle of neurovascular.

CONCLUSION

The most frequent cause of continuous dorsal spread in collar button abscesses is an infected palmar injury. Accurate diagnosis and efficient care are

made possible by a strong index of suspicion and a superior understanding of the anatomy and function of the hand. Early detection of collar-button abscesses is crucial because it informs the choice to make 2 incisions, one on the dorsal as well as another on the volar part of the hand, preventing incomplete abscess evacuation and the need for reoperation. Delaying therapy increases the chance of the infection spreading throughout the deep spaces, which could seriously affect hand function and harm neurovascular systems.

REFERENCES

1. Kanavel A. Infections of the Hand. Lea & Febiger, Philadelphia, PA, 1912.
2. Kour AK, Looi KP, Phone MH, Pho RW. Hand infections in patients with diabetes. Clin Orthop Relat Res 1996;331: 238-44.
3. Rigopoulos N, Dailiana ZH, Varitimidis S, Malizos KN. Closed-space hand infections: diagnostic and treatment considerations. Orthop Rev 2012;4. Article e19.
4. Hill NE, Roscoe D, Stacey MJ, Chew S. Cheiroarthropathy and tendinopathy in diabetes. Diabet Med 2019;36: 939-47.
5. Patel DB, Emmanuel NB, Stevanovic MV. Hand infections: anatomy, types, and spread of infection, imaging findings, and treatment options. Radiographics 2014;34:1968-86.
6. Koshy JC, Bell B. Hand infections. J Hand Surg Am 2019;44:46-54.
7. Kalbfell E, Adams NS, Cullen WT. Collar Button Abscess. Eplasty 2016;16:103-6.