

HAND INFECTION

AN ESSAY

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بِسْمِ اللّٰهِ الرَّحْمٰنِ الرَّحِیْمِ

”رب إشرح لی صدری ویر لی أمری

و أحلل عقدة من لسانی یفقهوا قولی“

صدق الله العظیم



TO MY WIFE

and

MY SONS (SHERIF AND MOHAMED)

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ACKNOWLEDGEMENT

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INTRODUCTION

Introduction

Hand infections are common among manual workers and house wives. They are responsible about loss of many work hours which affect our economy so this subject is selected for study.

An understanding of the aetiology and treatment of hand infection is important in order to maintain sensation, motion and strenght in the digits and to avoid serious complications which may lead even to amputation.

Extensive and severe hand infections as, acute suppurative tenosynovitis, mid-palmar and, thenar space infection occur but infrequently. Prompt medical attention and bacteriocidal drugs used systemically and locally decreased the severity and extent of hand infections and have made secondary, general and local effects less severe (Hart, D1954).

The surgeon should be familiar with principles as, the mechanism of injury, causative organism.

Anatomical localisation of the infection, and principles of treatment including the choice of drugs, methods of immobilization, techniques of incisions, drainage, the methods of anaesthesia and post-operative rehabilitation (Iselin, M1940).

Pyogenic infections of the hand often develop and spread as a result of failure to preserve or restore good venous

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and lymphatic drainage following trauma. In order to prevent as well as to treat infection it is necessary to control swelling and congestion of tissues and to avoid any dead space filled with stagnant blood or serum.

Inflammation causes increase in tissue tension by sequestration of oedema fluid. This in turn impairs tissue oxygenation by compressing the blood vessels, and a vicious cycle may develop, which can lead to necrosis within the constrictive sleeves of fascia and skin (Kanavel, 1939).

Acute swelling predisposes to infection especially if there has been contamination through a puncture of open wound.

Tissues and structures with a limited blood supply are most susceptible to infection. Tissue around the nail, joints, tendon sheath and bones have the least natural resistance to infection (Kontras, 1968).

In the present study, most varieties of hand infection their predisposing causes and causative micro-organisms and their sensitivity to antibiotics were recorded in an attempt to come out with the optimum methods of managing these infections and to reach proper decisions as regards surgical intervention, and whether medical treatment is needed before, after or both before and after operating.

SURGICAL ANATOMY

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SURGICAL ANATOMY OF THE HAND

The hand of man differs from the manus of other creatures in being a grasping mechanism combining great strength with finely controlled accuracy and at the same time serving as the chief tactile organ.

(LAST, R.J. 1973).

The hand is an organ of apprehension and exquisite sensibility. The sensory function is dependent upon the fact that the terminals of the digital nerves are connected with specialized endorgans (tactile corpuscles) in the papillary layer of the skin. The hand, directed by the will and guided in a large measure by the eyes, can perform a great variety of delicate and complicated movements through the highly coordinated action of its extrinsic and intrinsic muscles and its complicated system of joints. This is witnessed in the marvelous dexterity acquired by musicians, magicians and skilled mechanics. The hand is divided into palmar, dorsal and phalangeal regions.

(ANSON, B.J. & MC VAY, C.B. 1971).

PALMAR REGION

The palm is roughly quadrilateral in outline, and comprises all the soft parts in front of the metacarpal bones and the volar interosseous muscles the triangular

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central part is depressed into the hollow of the hand and is bounded on each side by a well defined projection of muscle that on the radial side, the thenar eminence, formed by the short muscles of the thumb, and that on the ulnar side, the hypothenar eminence, formed by the short muscles of the little finger approximate each other as they approach the wrist. Their line of junction is indicated by a shallow median groove which leads across the wrist toward the tendon of the palmaris longus.

(ANSON, B.J. & McVAY, C.B. 1971).

The skin of the palm is characterized by flexure creases (the lines of the palm) and the papillary ridges, or fingerprints, which occupy the whole of the flexor surface. Perhaps the latter serve to improve the grip; certainly they increase the surface area. Sweat glands abound. The little palmaris muscle is attached to the dermis; it is a part of the panniculus carnosus. It lies across the base of the hypothenar eminence and is the only muscle supplied by the superficial branch of the ulnar nerve. It may improve the grip by steadying the skin on the ulnar side of the palm. Elsewhere the skin is steadied by its firm attachment to the palmar aponeurosis. Fibrous bands connect the two and divide the subcutaneous fat into myriads of small loculi, forming a water-cushion capable of with-standing considerable pressure, when cut the tension causes some bulging of these fatty loculi.

(LAST, R.J. 1981).

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Transverse flexion creases in the palm and digits indicate additional tethering of the skin at the MP, PIP and DIP joint. Flexion creases in particular at these points the flexor sheaths are thin since they are composed of only transverse fibers and little subcutaneous tissue intervenes between them and the skin.

The distal phalangeal pulp is securely bound proximally by the DIP joint flexion crease and the middle phalangeal pulp area distally by that crease and proximally by the PIP joint flexion crease. The proximal phalangeal pulp is not as firmly demarcated by the proximal finger flexion crease however.

(SANDLER, S.C. 1980).

Subcutaneous tissue.

The subcutaneous tissue of the palm of the hand, often referred to as superficial fascia is a particularly tough layer that intervenes between the skin and the deep, fascia (the palmar aponeurosis, the thenar, hypothenar fascia and in the finger tendon flexor sheaths). The subcutaneous tissue contains fat especially over the fingers, the fat is markedly subdivided by the connective tissue septa.

Septa attaching to the palmar and digital creases are especially strong and serve to prevent slipping of the skin when something is held firmly in the grip. On the sides of the fingers special septa (the cutaneous ligaments of the digits) form imperfect canals in which run the digital nerves and vessels. The palmar subcutaneous tissue of the digits, especially on the terminal phalanges is frequently referred to as the pulp of the fingers; similarly, this tissue in the palm is sometimes referred to as the palmar pulp. The subcutaneous tissue of the palm contains the limited palmar venous network which drains mostly toward the sides of the digits and of the palm, small cutaneous twigs of nerves and arteries also course in it, after having penetrated the deep fascia of the wrist or hand. In the fingers, the large palmar digital nerves and vessels lie in the subcutaneous tissue on the sides of the flexor tendons, they lie, however, not loosely in the pulp, but rather in a sort of tunnel formed by septa **stretching** from the phalanges to skin, these septa have been described as the cutaneous ligaments of the digits. The septa dorsal to the digital nerves and vessels were originally called Cleland's **ligaments**.

(HOLLINSHEAD, W.H. 1982).