

HAND AND WRIST ORTHOPEDIC SURGERY AT THE NAZARETH TOWERS DURING 2015-2016: EPIDEMIOLOGY AND RISK FACTORS

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ABSTRACT

Introduction: The hand and wrist considered a unique and sophisticated part of the human body that is composed of delicate structures encompasses bone, ligaments, tendons, muscles, nerves, skin, and blood vessels. In this study, we stress the importance of the outpatient clinic as a novelty development for performing small surgeries and its various benefits. **Methods/participants:** In a retrospective study, we assessed the surgical procurers of hands and wrists, their types; in addition to the risk factors underlying their pathology in the Nazareth medical towers in north Israel. 199 patients underwent hands and wrists surgery on an outpatient basis in the Nazareth medical towers, during 2015-2016. All participants underwent a series of interviews; demographic data and comprehensive

clinical records at study entry after receiving a consent form agreements from all the participants. Electrodiagnostics testing used to confirm the diagnosis. **Results:** The total number of our patients who underwent surgical interventions for hands and wrists was = 199, the mean age was 54.7 ± 13.4 years. 110/199 (55.3%) underwent surgical intervention for Carpal Tunnel Syndrome (CTS); 70/199 (35%) underwent surgical intervention for Trigger Finger (TF); 9/199 (4.5%) performed (TF + CTS); 9/199 (4.5%) underwent surgical intervention for De Quervain's Syndrome, so-called "Techno Thumb," and 1/199 (0.5%) underwent Ganglion surgery. Males were 40% and females 60%; Arabs patients were (n=94, 47%), Jews represent the majority (n=105, 53%). The education levels for our patients was as follow: 23/199 graduated from elementary school; 88/199 graduated from secondary school;

28/199 graduated from college; and 33/199 graduated from university. 46/199 (23%) suffered from Diabetes mellitus and 153/199 (77%) were diabetics free. Complications after surgery was reports in few patients as follow: 2/199 patients presented with secretion discharges and only 3/199 presented with redness and swelling. **Conclusions:** Recently a new development of outpatient surgery center at the Nazareath medical Towers, General Medical Services-Sheruti Briut Clalit- begin to give services to all patients who required small surgical procedures. A shifting phenomenon of small surgical procedures such hands and wrists has removed dramatically from inpatient to an outpatient setting. 88% of our patients were very satisfied with our services, 90% of patients were extremely satisfied of the reliability and good attitude of doctors and nurses. 92% recommend other people to consider our outpatient surgical center. Our study encourage the importance of this novelty in the light of the various advantages, which poured in the interest of the both parties: the outpatient center and the patients. Indeed, plethora of advantages observed because of this novelty. Reduced the recovery period and convenience of recovering in home, which generally makes recovery time quicker and easier than an in-hospital stay. Decreased stress is another advantage of outpatient in addition to the tremendous savings associated with outpatient surgeries when compared to the same procedure in a standard facility.

KEYWORDS: Hand and wrist, Orthopedic surgery, Carpal Tunnel syndrome, Trigger Finger, De Quervain's Syndrome, Outpatient Clinic.

INTRODUCTION

The hand is a unique and sophisticated part of the human body that is composed of delicate structures encompasses bone, ligaments, tendons, muscles, nerves, skin and blood vessels. Hand and wrist work in harmony to permit us to execute activities of daily living. Hands possess not only plethora of essential functions, but can increase our humanity. Giving us the ability to discover our environmental, to communicate, grip and feel as well as participating in athletic and artistic endeavors. Dysfunction of wrist and hand can therefore have serious impact on lifestyle. We assessed the surgical procurers of hands and wrists surgery, their types; in addition to the risk factors underlying their pathology in the Nazareth medical towers in north Israel. The most common procedures performed by our specialists are: Carpal Tunnel Syndrome; trigger finger, ganglion excision and De Quervain's Syndrome. The surgery performed after long treatment with conservative treatments, without sufficient recovery (Figure 1).

Carpal Tunnel Syndrome

Carpal tunnel syndrome (CTS) is the most common entrapment mononeuropathy occurs when there is increased pressure on the median nerve at the wrist in the carpal tunnel. The carpal tunnel is a narrow, tunnel-like passageway in the wrist, about an inch wide. The carpal bones form the carpal tunnel bottom and sides and a strong band of connective tissue called the transverse carpal ligament covers its top.^[1,2]

It affects up to 10 percent of the population and is more common in females. Indeed, females are considerably more prone to this disorder in a ratio of 3:1 to about 10:1.^[3,4]

CTS are bilateral in up to 87% of patients clinically and approximate 50% through neurophysiologic testing.^[5]

Certain conditions, such as diabetes mellitus, amyloidosis, hypothyroidism, and rheumatoid arthritis, can predispose to CTS.^[6] Obesity and pregnancy are also risk factors for CTS.^[7]

Compression of a nerve in the hand, forearm or elbow can result in a loss of strength, weakness, numbness and tingling, increased sensitivity, pain, and an inability to do activity of daily living.^[8]

Symptoms, which are often worse at night, when there is an increased pressure in the carpal tunnel; this usually occurs when the wrist is flexed or extended for prolonged periods.^[9]

The median nerve plays crucial role in the causation of this syndrome, because it supplies sensation to the thumb, index, middle, and part of the ring fingers. The median nerve also supplies motor innervation to a muscle in the thumb. Diagnosis of the condition is by a history and physical examination, and electrodiagnostic testing, made up of nerve conduction and electromyography (EMG) testing, is used to confirm the diagnosis of carpal tunnel syndrome and other nerve disorders.^[3,10,11]

The sensitivities of electrodiagnostic methods have ranged between 49% and 84% with specificities of 95% or higher.^[12]

There are both conservative and surgical options for the treatment of CTS. Early treatment consists of wrist splinting, anti-inflammatory medication, vitamins B, steroid injections and changing the job.^[13]

Other techniques such as carpal tunnel decompression also benefits patients with severe muscular atrophy and sensory deficits, and those with underlying peripheral neuropathy.^[14,15]

If symptoms do not improve, an outpatient surgical procedure to relieve the pressure on the nerve is warranted. Surgeons have used two less invasive approaches to carpal tunnel surgery: The mini open approach, which involves a smaller incision, a shorter recovery time and possibly a lower risk of complications than the traditional procedure. The endoscopic approach, which is a minimally invasive technique, involves making small incisions in the palm and wrist and inserting one or two camera-equipped tubes called endoscopes to view the inside of the wrist on a monitor. In the end, carpal tunnel release is a highly effective surgery that can relieve the hand pain and numbness caused by carpal tunnel syndrome.^[16-19]

Trigger finger

Trigger finger is a common cause of pain and disability in the hand. It is also the fourth most common reason for referral to the hand outpatient clinic. The condition has a reported incidence of 28 cases per 100 000 population per year, or a lifetime risk of 2.6% in the general population. This rises to 10% in patients with diabetes. It is more common among women than men in the fifth or sixth decade of life.^[20]

Trigger finger presents with discomfort in the palm during movement of the involved digits. Gradually, or in some cases acutely, the flexor tendon causes a painful click as the patient flexes and extends the digit. The tendons of the thumb and each of the fingers pass through a sheath on the palm side of the hand. Digital flexor tendinitis and tenosynovitis are inflammation, pathologic changes begin with a thickening or nodule within the tendon; when located at the site of the tight first annular pulley, the thickening or nodule blocks smooth extension or flexion of the finger.^[21-22]

The finger may lock in flexion, or “trigger,” suddenly extending with a snap. Sometimes with subsequent fibrosis, of tendons and tendon sheaths of the digits. The condition may be idiopathic but a certain diseases such as rheumatoid arthritis or diabetes mellitus and repetitive use of the hand or overuse activities can cause a thickening of this sheath.^[23,24]

As the tendon passes through a thickened sheath, the tendon eventually becomes irritated and swells. Pain, catching and eventually locking of the finger will occur.^[25] Treatment includes conservative measures, sometimes corticosteroid injection and anti-inflammatory

medications. If these fail to provide relief, the sheath is opened surgically through a small incision at the base of the finger.

Ganglion Cysts

A ganglion is a fluid filled cyst that can occur anywhere on the fingers, hand or especially on the dorsal aspect of the wrists. Generally, ganglia are benign soft tissue tumors most commonly encountered in the wrist, but which may occur in any joint.^[26] but also may arise from a number of other sites over the dorsal aspect of the wrist capsule.^[27,28]

The etiology of most ganglion is unknown and no one knows what triggers the formation of a ganglion. Unfortunately, the origin of the ganglion itself remains as enigmatic as the origin of its fluid. The theory that ganglion have an inflammatory etiology has been debunked by pathologic studies showing no pericystic inflammatory changes.^[29,30]

The cystic organizations are near or attached by a pedicle to tendon sheaths and joint capsules. The wall of the ganglion is smooth, fibrous, and of variable thickness. The cyst is filled with clear gelatinous, sticky, or mucoid fluid of high viscosity. The fluid in the cyst is sometimes almost pure hyaluronic acid. Ganglia constitute about 60% of chronic soft-tissue swellings affecting the hand and wrist. They usually develop spontaneously in adults aged 20 to 50, with a female: male preponderance of 3:1, and ganglions are common among gymnasts, who repeatedly apply stress to the wrist. Large ganglions, even if they are not painful, are unattractive. Smaller ganglions that remain hidden under the skin (occult ganglions) may be quite painful. Sometimes, an MRI or ultrasound is needed to find a ganglion cyst hidden under the skin.^[31,32]

The size of a ganglion may vary over time and with use of the hand. Most ganglia are isolated abnormalities. The dorsal wrist ganglion arises from the scapholunate joint and constitutes about 65% of ganglia of the wrist and hand.^[33,34]

The volar wrist ganglion arises over the distal aspect of the radius and constitutes about 20 to 25% of ganglia.^[35]

Flexor tendon sheath ganglia and mucous cysts (arising from the dorsal distal interphalangeal joint) make up the remaining 10 to 15%. Ganglia are evident on examination. Another type of ganglion on the dorsal wrist occurs in patients with rheumatoid arthritis; its soft irregular appearance and association with proliferative rheumatoid extensor tenosynovitis easily

differentiate it. Ganglion cysts do not require treatment. However, if the patient is suffer by its appearance or if the ganglion is painful because the fluid-filled sac puts pressure on the nerves that pass through the joint, or tender, a single aspiration with a large-bore needle is effective in about 50% of patients.^[36]

Attempting to rupture the ganglion by hitting it with a hard object risks local injury without likely benefit. Nonsurgical treatment fails in about 40 to 70% of patients, necessitating surgical excision. Excision can be done via arthroscopic or standard open surgery. Recurrence rates after surgical excision are about 5 to 15%.^[26]

De Quervain Syndrome

De Quervain's Tenosynovitis - is an inflammation of the tendon sheath in the thumb region - or De Quervain's tendonitis on the thumb side of the wrist can be a very painful and disabling condition. Simple pinching and twisting activities can be almost impossible. It occurs when the tendons around the base of the thumb are irritated or constricted. Swelling of the tendons, and the tendon sheath, can cause pain and tenderness along the thumb side of the wrist. The tendons to the thumb become inflamed as they pass under a ligament and the slightest motion of the wrist can cause pain. Any swelling of the tendons and/or thickening of the sheath, results in increased friction and pain with certain thumb and wrist movements.^[37]

Especially, a "catching" or "snapping" sensation may be felt when moving the thumb. De Quervain's tendinosis may be caused by overuse. It also is associated with pregnancy and rheumatoid disease. It is most common in middle-aged women. Treatment consists of rest, medication and occasionally the use of a steroid injection. If these treatments do not provide relief over time, the tendons can be surgically released. The goal of surgery is to open the thumb compartment (covering) to make more room for the irritated tendons.^[38,39]

METHODS

A retrospective study during 2015-2016, 199 patients underwent hands and wrists surgery on an outpatient basis in the Nazareth medical towers in north Israel. All participants underwent a series of interviews; demographic data and comprehensive clinical records were collected at study entry including confirmation of the diagnosis with the use of nerve electrodiagnostic testing including of nerve conduction studies (NCS) and electromyography (EMG) testing. In fact, when a patient had neurological symptoms like weakness or numbness, electrodiagnostic testing might be the appropriate thing to do, but this is only after a thorough

physical exam, and it should be correlated with the clinical findings of the patient. The test then helps identify if there is a peripheral neurological problem, where it's coming from, whether it is localized to one spot, or whether it's indicative of a more generalized condition. In addition, participants permitted to participate in the study, after its approval by the ethical committee of the Nazareth medical towers and obtaining signed consent from all participants.

RESULTS

The total number of our patients who underwent surgical interventions for hands and wrists was = 199, the mean age was 54.7 ± 13.4 years. 110/199 (55.3%) underwent surgical intervention for Carpal Tunnel Syndrome (CTS); 70/199 (35%) underwent surgical intervention for Trigger Finger (TF); 9/199 (4.5%) performed (TF + CTS); 9/199 (4.5%) underwent surgical intervention for De Quervain's Syndrome, so-called "Techno Thumb," and 1/199 (0.5%) underwent Ganglion surgery. Males were 40% and females 60%; Arabs patients were (n=94, 47%), Jews represent the majority (n=105, 53%). The education levels for our patients was 23/199 graduated from elementary school; 88/199 graduated from secondary school; 28/199 graduated from college; and 33/199 graduated from university. 46/199 (23%) suffered from Diabetes mellitus and 153/199 (77%) were diabetics free. Complications after surgery was reports in few patients as follow: 2/199 patients presented with secretion discharges and only 3/199 presented with redness and swelling (Figures 2 – 6).

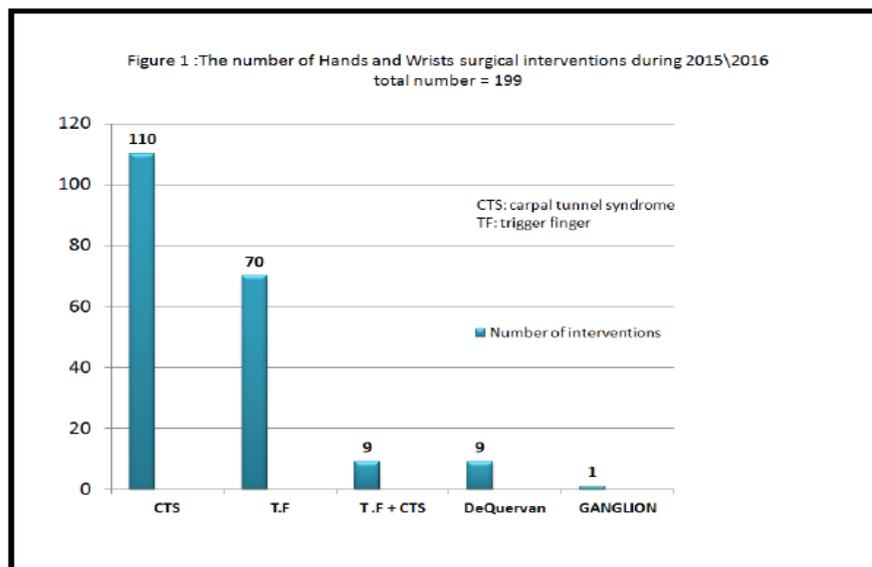


Figure 2 : The distribution of surgical interventions of Hands and Wrists according to gender

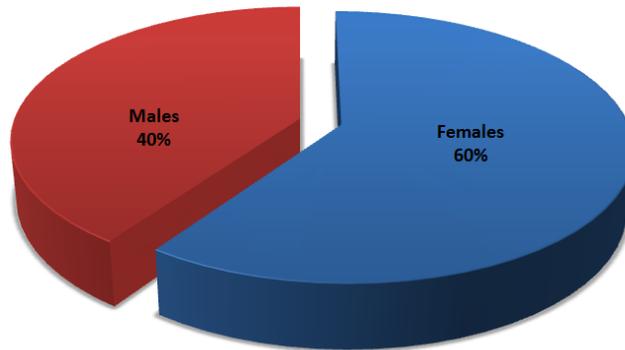


Figure 3 : The distribution of surgical interventions of Hands and Wrists according to ethnic origin

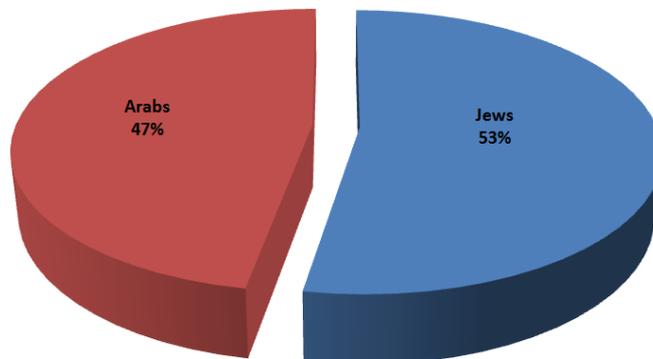
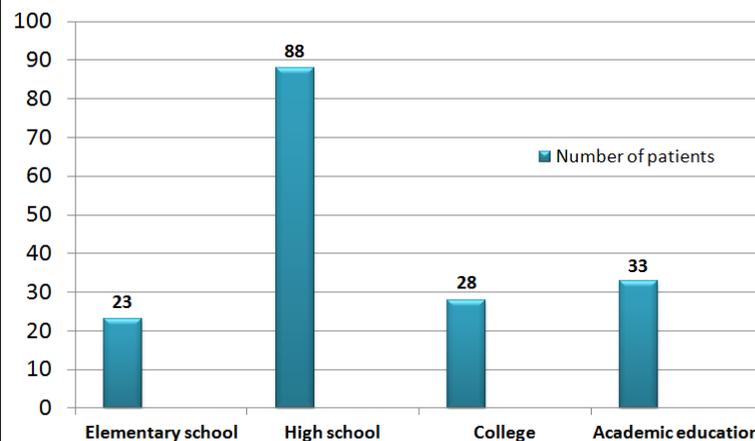
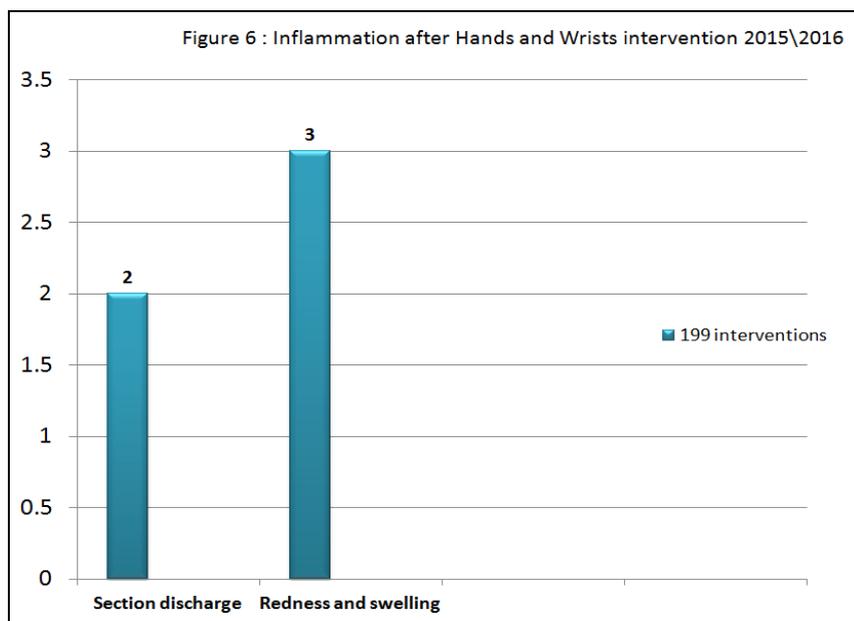
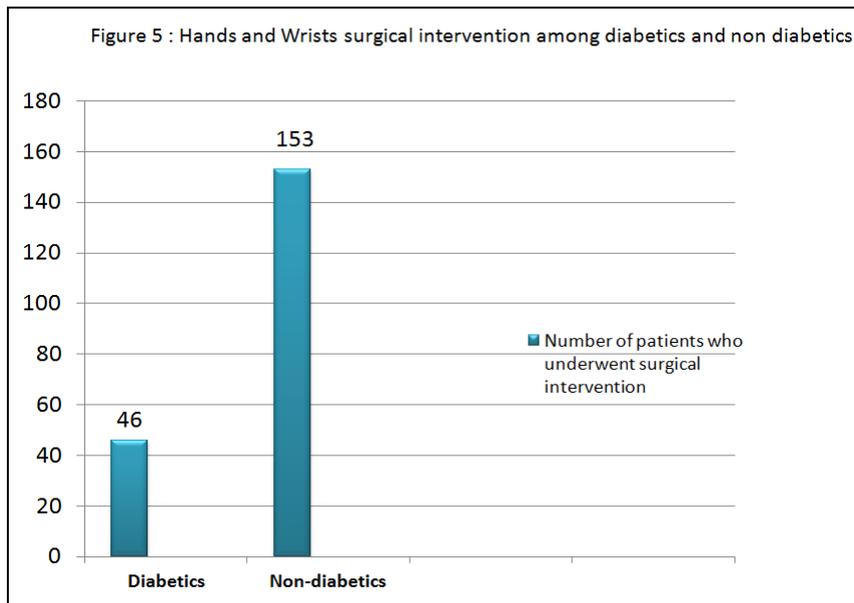


Figure 4 : Education levels among our patients who underwent surgical intervention





CONCLUSION

Years ago, many surgical interventions were done in a hospital setting because it was the only facility available that had the talent and the tools to correctly complete the procedures. Today, many surgical procedures that do not require an overnight stay for observation are done in an outpatient surgery center instead. Indeed, outpatient surgery centers are required to comply with many of the same standards, constraints and requirements as inpatient hospital operating rooms. However, the past decade has seen a dramatic rise in surgery volume being performed in an outpatient setting. Recently a new development of outpatient surgery center at the Nazareath medical Towers, General Medical Services —Sheruti Briut Clalit- begin to give

services to all patients who required small surgical procedures and overall procedure volume has shifted dramatically from inpatient to an outpatient setting.

The most common procedures performed by our specialists are: carpal tunnel release, cubital tunnel release, tennis elbow surgery, trigger finger, ganglion excision, excision of benign hand tumors, deQuervains and tendonitis surgery, and repair of tendon, In fact, many benefits associated with having an orthopedic surgical procedure done at an outpatient surgery center. The advantages of this kind of procedure include a reduced recovery period: convenience of recovering in home generally makes recovery time quicker and easier than an in-hospital stay. Lower cost - Since there are no hospital room charges, and related hospital charges, costs are much lower for outpatient surgery. There are tremendous savings associated with outpatient surgeries when compared to the same procedure in a standard facility.

Reduced stress is another advantage of outpatient surgery - In the majority of cases; outpatient surgery is less stressful than inpatient surgery.

Scheduling is more predictable - In a hospital setting, emergency surgeries and procedures that take longer than expected can delay scheduled surgeries. An outpatient setting can generally stay within a set schedule since the procedures are simpler and more routine. In general, most patients go home between one and four hours after outpatient surgery.

In addition, at the Nazareth medical Towers, General Medical Services —Sheruti Briut Clalit- we conducted a questionnaire asking our outpatients who underwent surgical procedures whether they were satisfied with our services. 88% of patients were very satisfied with our services, 90% of patients were extremely satisfied of the reliability and good attitude of doctors and nurses. 92% recommend other people to consider our outpatient surgical center.

ABBREVIATIONS

CTS: Carpal Tunnel Syndrome

TF: Trigger finger

MRI: Magnetic Resonance Imaging

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CONFLICT OF INTEREST INFORMATION

The authors have no conflicts of interest to disclose.

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