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Introductory Chapter: The Art of Hand Surgery

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1. Introduction

Hand and upper limb surgery is one of the most difficult areas in plastic and orthopedic surgery. It demands thorough knowledge of normal hand anatomy and great expertise in adequately diagnosing and treating the multiple pathologies that can affect the hand, followed by the selection of the best individualized postsurgical hand therapy, in order to lead our patients into the reestablishment of their hand's function.

A strong functional hand with normal range of movements is the main characteristic among human beings. With our hands we can perform our normal daily activities, interact with other people, perform our jobs, play musical instruments, and participate in most of our activities. Our hands and fingertips are the doors to the world, being so adaptable, that they can even make a blind man read or a deaf-mute speak. This is why we must approach each of our cases with artistry, trying to recover maximum mobility, sensibility, stability, and strength possible, getting rid of all of the pain the patient may have, in order to regain its function and unique esthetics [1].

It is mandatory for a hand surgeon to have some special characteristics. He or she must have sound surgical skills, a natural sense of artistry, must be an expert in hand anatomy, must be imaginative and creative in order to perform and design new techniques, should be delicate enough with the different hand tissues, should pay careful attention to the most minimum detail, and have the maximum technical precision in order to be successful. With the invention of the microscope and the refinement in surgical instruments we can now perform surgeries we have never even dreamt, be less aggressive, and achieve better and amazing results with each surgery.

2. Performing the right surgery

As in every aspect of medicine, the key to success in hand surgery is to make an accurate diagnosis based on a complete history and physical examination of our patient. Once you have an exact diagnosis you will know exactly what to operate and most importantly when to perform that operation. We, as surgeons, have that rush to try to solve everything as soon as it is presented to us. We know we can solve things, but we also have to be very patient to know the perfect timing and when to do it in order for our surgeries to be successful and to achieve the best results possible.

3. Diagnostic methods

Besides our own eyes and hands, there are some other special diagnostic tests we can use in order to finally determine the exact problem. One of the most common and routinely performed tests are simple plain hand X-rays. As we know, the hand is a complex structure where many anatomic elements interact with each other. It is not just skin and subcutaneous tissue; we have bones, ligaments, tendons, nerves, arteries, veins, muscles, and joints that when acting together the hand will achieve a normal and complete function. There are some other special tests that can be asked in some special situations, like CT scans, MRI, electromyography, nerve conduction studies, Doppler ultrasound, and so on. As we have said the diagnosis must be made by us, not be expected to pop out spontaneously by some random and unnecessary studies.

4. Planning the operation

Once you have an accurate diagnosis it is plan for the next step, planning the operation. It is not enough for a hand surgeon to have just a plan for the surgery. You must have a plan B and a plan C and just as many as you need in order to act if something goes wrong. It is just not a matter of performing the surgery; it is a matter of knowing what to do and how to do it. From the incision planning to the closure of the skin, each step must be taken into consideration. Even though you are an experienced hand surgeon, our advice is to always plan your surgery the night before you perform it when it is possible. There is no small surgery; even the ones considered “easy” could turn into difficult challenges for the surgical team [2].

5. Special considerations during surgery

As you plan your surgery, there are some important aspects you may want to take into consideration that will surely affect the course of your performance. First, the incisions you plan are important, because you need the best exposure you can get with the incision you



Figure 1. Use of microscope, microsurgical instruments, hand table and controlled ischemia of the hand during surgery.

plan. Other important questions are as follows: What type of anesthesia will you use? Will you use local anesthesia? What nerves will you anesthetize? What is the type and duration of ischemia of the hand? Will you have pauses between periods of ischemia? At what pressure will the tourniquet be inflated? Is a microscope needed for the procedure? Is there any special equipment or instruments you may need? Do you need microsurgical instruments? Do you need equipment for bony fixation? Do you have your surgical loupes or some kind of magnification? Will you need X-rays to be taken after bony fixation? Is every suture you are going to need ready? What type of cast or immobilization will you use after the procedure? These questions ideally must be answered during your planning as if it was a checklist so it will be easier for you to make sure everything is ready before the surgery takes place (Figure 1).

6. Post-operative care

Once you have completed your surgery, you have to decide if your patient may need a special rehabilitation program so he or she can get the best functional result possible. For some procedures, it would just be enough with some exercises the patient can perform at home. For some others, you may need special casts or immobilization, followed by specialized hand therapy. It is important to discuss these questions with the patient before the procedure takes place. As I usually say to my patients, the results depend 50% in the surgery itself, and the other 50% will depend on the patient itself and on the hand therapist. This specialized work is not just a one-day job. It is mandatory that the hand surgeon reevaluates his patient as many times as needed until his or her function has been completely reestablished.

7. Conclusions

The aim of this chapter is to provide the reader with a comprehensive and state-of-the-art overview of the normal hand and upper extremity, its physical examination, how to make an accurate diagnosis of the diverse situations that can affect it, and to discuss the most important evidence-based methods of treatment available worldwide today.

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