
Plastic-Reconstructive Hand Surgery: a Multidisciplinary Procedure

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ABSTRACT

The present study aims to provide a detailed and accurate summary of reconstructive aesthetic hand surgery in medical terms. This specialized surgical intervention comprehensively addresses the functional and aesthetic alterations affecting the hand, through complex and personalized techniques. Aesthetic reconstructive hand surgery is indicated in a variety of clinical situations, including hand trauma, congenital malformations, degenerative diseases, soft tissue defects, tumors and post-surgical reconstruction. Each case requires a thorough and personalized evaluation to determine the most appropriate surgical approach and to achieve satisfactory results. The anatomical complexity of the hand, consisting of bones, joints, tendons, muscles, nerves and blood vessels, requires in-depth knowledge on the part of the surgeon. The multidisciplinary approach, in collaboration with specialists in plastic surgery, orthopedic surgery, occupational therapy, physiotherapy and rehabilitative medicine, is crucial to the success of the intervention. Aesthetic reconstructive hand surgery seeks to restore hand function, improve aesthetic appearance and ultimately improve patients' quality of life. The focus is on repair and reconstruction of affected tissues, correction of deformities, stabilization of joints, revision of scars, and optimization of hand shape and contour.

ARTICLE DETAILS

Published On:

12 June 2023

Available on:

<https://ijmscr.org/>

INTRODUCTION

Aesthetic reconstructive hand surgery is a highly specialized surgical procedure that aims to restore function and improve the aesthetic appearance of the hand and fingers after traumatic injury, disease or congenital defect.¹

This form of surgery combines elements of plastic surgery, reconstructive surgery and orthopedic surgery to address a wide variety of hand-related problems. These may include complex fractures, partial or total finger amputations, congenital deformities such as polydactyly or syndactyly, as well as nerve, blood vessel and tendon damage.¹

During surgery, a combination of reconstructive techniques is used to restore bone structure, tendon and nerve function, and proper blood circulation to the affected hand. This may involve fracture fixation with plates and screws, tissue grafting from other parts of the body to reconstruct damaged areas, tendon repair or transfer to restore grip function and mobility, as well as microsurgery to reattach blood vessels and nerves.²

In addition to addressing the functional aspects of the hand, cosmetic reconstructive hand surgery also focuses on improving the aesthetic appearance of the hand and fingers. This may involve correcting scars, reconstructing soft tissue to improve the shape and contour of the hand, and performing additional procedures, such as liposuction or fat transfer, to achieve an optimal aesthetic result.³

BACKGROUND

Aesthetic reconstructive hand surgery is an intervention of great relevance in the medical field, due to its ability to comprehensively address the functional and aesthetic aspects of the hand affected by traumatic injuries, congenital malformations or debilitating diseases.⁴

First and foremost, this form of surgery is essential to restore hand function. The hand is an extremely complex anatomical structure and crucial for performing a wide range of daily activities. Traumatic injuries, such as fractures, amputations or nerve and tendon damage, can cause significant loss of grip

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function, mobility and manual dexterity. Reconstructive hand surgery uses advanced techniques to repair and reconstruct the affected tissues, allowing recovery of function and restoration of the ability to perform essential activities.⁵

In addition to restoring function, reconstructive cosmetic hand surgery also plays an important role in improving the physical appearance of the hand and fingers. The hand is a highly visible part of the body and the presence of deformities, scars or malformations can have a significant impact on patients' self-esteem and quality of life. Aesthetic reconstructive hand surgery focuses on correcting these aesthetic alterations through specialized techniques, such as scar correction, soft tissue reshaping and optimizing the shape and contour of the hand. By improving aesthetic appearance, patients' confidence and emotional well-being are promoted, which can have a positive impact on their overall quality of life.⁵

In addition, reconstructive cosmetic hand surgery also contributes to the patient's overall rehabilitation. Working collaboratively with occupational therapists, physical therapists and rehabilitation medicine specialists is crucial to achieve optimal recovery after surgery. These professionals can assist with movement therapy, muscle strengthening and functional rehabilitation, allowing patients to regain their independence and reintegrate into their daily activities.⁵

In summary, reconstructive cosmetic hand surgery is relevant because of its ability to comprehensively address both the functional and aesthetic aspects of the affected hand. By restoring grip function and mobility, as well as improving physical appearance, this form of surgery can have a significant impact on patients' quality of life, self-esteem and emotional well-being. It is a highly specialized procedure that combines expertise from plastic surgery, reconstructive surgery and orthopedic surgery, and requires the collaboration of a multidisciplinary team to achieve the best possible results.⁶

Special considerations

1.-Aesthetic reconstructive hand surgery presents a number of special considerations due to the anatomic and functional complexity of the hand, as well as the need to address both the aesthetic and functional aspects of the procedure. The following are some of the key considerations:^{7,8,9}

2.-Complex anatomy of the hand: The hand is composed of an intricate network of bones, joints, tendons, muscles, nerves and blood vessels. The surgeon must have a thorough knowledge of this anatomical complexity to perform surgery accurately and safely.

Multidisciplinary approach: Aesthetic reconstructive hand surgery requires a multidisciplinary approach, with the collaboration of specialists in plastic surgery, orthopedic surgery, occupational therapy, physiotherapy and rehabilitative medicine. This comprehensive approach

ensures a complete assessment of the patient's needs and allows for an individualized treatment plan.

3.-Detailed preoperative evaluation: Before surgery, a thorough evaluation of the condition of the hand and surrounding tissues is performed. This may include imaging tests, such as X-rays, MRI or CT scans, to evaluate bone structure, nerves and blood vessels. This preoperative assessment helps to plan the most appropriate surgical approach and to identify any potential complications.

4.-Customized reconstruction: Each case of reconstructive cosmetic hand surgery is unique, and the surgical plan must be tailored to the individual needs and goals of the patient. This involves customization of the surgical techniques used, selection of appropriate tissue grafts and attention to aesthetic details to achieve satisfactory and natural results.

5.-Functional restoration: In addition to aesthetic improvement, recovery of hand function is a fundamental objective of this surgery. This involves careful attention to the repair and rehabilitation of affected tendons, nerves and blood vessels, as well as consideration of hand biomechanics and grip function during the surgical process.

6.-Complication management: Because the hand is such a complex structure, cosmetic reconstructive hand surgery can be associated with a number of potential complications, such as infection, loss of sensation, scarring problems, stiffness or residual weakness. It is important that the surgeon be prepared to identify and manage these complications in a timely and effective manner.

Postoperative rehabilitation: Complete recovery after cosmetic reconstructive hand surgery involves a comprehensive rehabilitation program. This may include occupational therapy, physical therapy, strengthening and mobility exercises, as well as the adaptation of techniques and tools to improve hand functionality. Aesthetic reconstructive hand surgery presents special considerations due to the anatomic and functional complexity of the hand, the need for a multidisciplinary approach, customization of treatment, restoration of function, and management of potential complications. A comprehensive approach and meticulous attention to detail are critical to achieving optimal and satisfactory patient outcomes.⁹

INDICATIONS

Aesthetic reconstructive hand surgery is indicated in various clinical situations in which it is required to restore function and improve the aesthetic appearance of the hand affected by traumatic injuries, congenital malformations or acquired diseases. The following are some of the common indications for this type of surgery:^{10,11,12}

Hand trauma: Reconstructive cosmetic hand surgery is indicated in cases of severe trauma, such as complex fractures, partial or total finger amputations, tendon, nerve or blood vessel injuries, as well as in cases of crush injuries. The

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procedure aims to repair and reconstruct the affected tissues, restoring function and improving the aesthetic appearance of the hand.

Congenital malformations: Some patients are born with congenital malformations of the hand, such as polydactyly (presence of extra fingers) or syndactyly (fusion of the fingers). Cosmetic reconstructive hand surgery is indicated in these cases to correct the abnormalities, separate the fused fingers and restore a normal appearance and function.

Degenerative diseases: In cases of degenerative diseases, such as rheumatoid arthritis or osteoarthritis, reconstructive cosmetic hand surgery may be necessary to treat the associated deformity and pain. This may involve reconstruction of damaged joints or stabilization of joint structures to improve function and relieve symptoms.

Soft tissue defects: Aesthetic reconstructive hand surgery is used to correct soft tissue defects in the hand, such as keloid scars, contractures or muscle atrophy. Reconstructive procedures, such as scar revision, tissue grafting or fat transfer, are indicated to improve the aesthetic appearance and restore the functionality of the hand.

Tumors of the hand: In cases of benign or malignant tumors in the hand, reconstructive cosmetic surgery may be necessary to remove the tumor and reconstruct the affected tissues. This may involve resection of the tumor, followed by reconstructive techniques to preserve the function and cosmetic appearance of the hand.¹³

Post-surgical reconstruction: Aesthetic reconstructive hand surgery is also indicated in cases of post-surgical reconstruction, where there is a need to improve the appearance and functionality of the hand after previous surgery, such as tumor removal, correction of malformations or repair of injuries.¹³

It is important to note that each case is unique and requires individualized evaluation by the surgeon. Specific indications for reconstructive cosmetic hand surgery may vary depending on the patient's needs and goals, as well as the clinical evaluation and relevant diagnostic studies.¹

CONCLUSIONS

Cosmetic reconstructive hand surgery is a highly specialized and complex medical procedure used to address a variety of conditions that affect the function and appearance of the hand. This form of surgery combines elements of plastic surgery, reconstructive surgery and orthopedic surgery to achieve optimal results.

Aesthetic reconstructive hand surgery has multiple indications, including the treatment of severe traumatic injuries, such as complex fractures, partial or total amputations of fingers and injuries to tendons, nerves and blood vessels. It is also used to correct congenital malformations, such as polydactyly and syndactyly, and to treat degenerative diseases, such as rheumatoid arthritis or osteoarthritis.

In addition, aesthetic reconstructive hand surgery is effective in the correction of soft tissue defects, such as scars, contractures and muscle atrophies, and plays an important role in post-surgical reconstruction after tumor removal or other previous interventions.

This form of surgery requires a multidisciplinary approach, with the collaboration of specialists in plastic surgery, orthopedic surgery, occupational therapy, physiotherapy and rehabilitative medicine. A detailed and personalized preoperative evaluation is essential to plan the most appropriate surgical approach and identify possible complications.

Aesthetic reconstructive hand surgery seeks to restore both the function and aesthetic appearance of the affected hand, thus improving the quality of life and emotional well-being of patients. By addressing both functional and aesthetic aspects, satisfactory and natural results are achieved, improving patients' confidence and self-esteem.

However, it is important to note that cosmetic reconstructive hand surgery may be associated with potential complications, such as infection, loss of sensation, scarring problems, stiffness or residual weakness. It is essential that patients follow postoperative instructions and undergo appropriate rehabilitation programs for a full recovery.

Aesthetic reconstructive hand surgery is a major medical procedure that combines specialized knowledge and techniques to address the functional and aesthetic aspects of the affected hand. With a comprehensive approach and personalized care, optimal results are achieved and the quality of life of patients is improved.

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