

The Role of Plastic Surgeons in Hand Surgery: An Unacknowledged Expertise for Optimal Patient Care

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Abstract

Hand surgery represents a specialized field of surgical intervention that demands exceptional precision, dexterity, and an intricate understanding of hand anatomy and function. Every year thousands of patients of hand deformities and injuries lose their limb due to inadequate expertise in this field along with lack of knowledge among patients and practitioners like about the place of referral, more so ever in a timely manner. Among the various specialities practising hand surgeries, plastic surgeons too have unique skill set and comprehensive training necessary to excel in hand surgery. Plastic surgeons perform a variety of procedures in hand surgery and it is their obligation to recognize the importance of spreading the awareness regarding their role in hand surgery which will help a lot of patients in their community.

Keywords

1. Plastic surgeons
2. Hand surgery
3. Teaching

Introduction

Hand surgery has been an integral part of Plastic surgery since the inception of the field. Along with the other subspecialties of Plastic surgery like Burns, Aesthetic Surgery, Cranio- Maxillofacial Surgery, Pediatric Plastic Surgery, Peripheral nerve surgery and Microvascular Reconstructive surgery, Hand Surgery remains a vital integral component of plastic surgical practice as well as an important component of teaching program to its residents in India as well as in plastic surgical centers around the world. Various past studies have discussed regarding the residents training program encompassing the knowledge and skill of Hand surgery¹

Another critical fact remains that most doctors are not aware how hand surgery is an intricate and major component in the practice of a plastic surgeon. Agarwal and colleagues² reported that less than one third of graduating medical students

at their institution were aware that a plastic surgeon is qualified to treat disorders such as carpal bone fractures, nerve compression, and rheumatoid arthritis of the hand and wrist. Even after clinical exposure to a plastic surgery service, less than half of the students identified that a plastic surgeon is able to treat these disorders. So, the fact remains that a major awareness campaign is required by plastic surgeons demonstrating their usefulness in the field of hand surgery.

Hand surgery is a complex and intricate field that demands a specialized skill set to achieve successful outcomes. While various surgical specialties may engage in hand surgery, it is imperative to recognize the capabilities and training of plastic surgeons in this domain. This article aims to elucidate the reasons why plastic surgeons are the optimal surgeons to perform hand surgery, highlighting their unique expertise, comprehensive approach, and remarkable outcomes for patients.

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Hand Procedures performed by Plastic Surgeons

Plastic surgeons possess a skill set that allows them to tackle a myriad of reconstructive challenges in hand surgery. Their knowledge of tissue dynamics, microsurgery, and aesthetic principles allows for the restoration of form and function. Some common reconstructive procedures include:

1. Traumatic Hand Injuries: Plastic Surgeons routinely manage fracture as well as complex crush injuries of hands. The involvement of plastic surgeons is vital for the path towards complete management as well as rehabilitation of such patients.

2. Acute and chronic hand burns: Both acute burns and post burn chronic contractures and of hand require a specialized treatment in the form of specific dressing, wound management, contracture release and skin cover all of which are done under the guidance of plastic surgeons. (Fig. 1)

3. Microvascular Surgery: Plastic surgeons employ microsurgical techniques to repair severed nerves, arteries, and veins in the hand including reimplantation of totally amputated hand. (Fig. 2) This procedure is essential for restoring blood supply and sensation to damaged tissues. Various free flaps as well are applied with the technique of microsurgery.

4. Tendon and Ligament Repair: Plastic surgeons skilfully repair and reconstruct tendons and ligaments in the hand, enabling improved range of motion and functional capacity. (Fig. 3) Techniques such as tendon transfers are employed to restore lost function in cases of severe tendon damage.

5. Flap Reconstruction: When skin, soft tissue, or bone loss occurs in the hand, plastic surgeons utilize flaps to restore the damaged area. Local, regional, or distant flaps can be employed depending on the extent and location of the defect. (Fig. 4, 5)

6. Nerve Repair and Reconstruction: Plastic surgeons play a pivotal role in repairing damaged nerves in the hand. Techniques such as nerve grafting and nerve transfers are employed to restore sensation and function, particularly in cases of peripheral nerve and Brachial plexus injuries. (Fig. 6)

7. Congenital anomalies: A large myriad of congenital anomalies like syndactyly (Fig. 7) , polydactyly, macrodactyly, dysplasias and aplasias of digits require the adept intervention and management by a plastic surgeon. Wrinkles, and improve the overall appearance of aging hands.

Nail Bed Reconstruction: Plastic surgeons address nail bed deformities caused by trauma, chronic infections, or congenital abnormalities. Procedures include nail bed repair, reconstruction, or even nail transplantation.

Scar Revision: Plastic surgeons utilize various techniques to minimize the appearance of scars resulting from hand injuries or previous surgeries. These may involve excision, resurfacing, or dermal treatments to improve the texture and coloration of the scar.



Fig. 1.A. Post Burn Hand Contracture

1.B. Post Release and cover with SSG

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Aesthetic Procedures:

In addition to reconstructive procedures, plastic surgeons are also proficient in various aesthetic techniques to enhance the appearance of the hand. These procedures may be requested for cosmetic purposes or to correct deformities resulting from trauma, congenital conditions, or aging. Some aesthetic procedures include:

Hand Rejuvenation: Plastic surgeons employ a combination of procedures such as dermal fillers, fat grafting, and laser treatments to restore volume, reduce

1. Multidisciplinary Training
2. Microsurgical Proficiency
3. Aesthetic Considerations
4. Reconstructive Proficiency
5. Collaboration with Allied Therapists

Plastic surgeons undergo an extensive and comprehensive training program that encompasses various aspects of surgical care, including hand surgery. Their training equips plastic surgeons with a deep understanding of the intricate anatomy, functional mechanics, and aesthetic principles relevant to hand surgery.



Fig. 2.A. Total Wrist Amputation



2.B. Post Replantation

Dupuytren's Contracture Release: This condition, characterized by the thickening and contracture of the palmar fascia, can be effectively treated by plastic surgeons. Techniques such as fasciotomy, fasciectomy, or even collagenase injections are utilized to restore finger extension.

Discussion

There are various factors which may be considered for providing superior results in hand surgery which the plastic surgeons are able to deliver adequately.

Considerations for superior results in Hand surgery:

Hand surgery frequently requires intricate microsurgical techniques to restore function and sensation. Plastic surgeons are skilled in microsurgery, having acquired extensive experience in the delicate manipulation of blood vessels, nerves, and tissues under high magnification.³ This proficiency allows them to perform complex procedures such as nerve repairs, tendon transfers, reimplantation⁴, Brachial plexus injuries⁵ and vascularized tissue transfers with precision, ensuring optimal outcomes for patients. One of the distinct advantages of plastic surgeons in hand surgery is their expertise in addressing both functional and aesthetic concerns. The hands play a vital role in interpersonal communication

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and self-esteem, and any hand surgery should take into account the overall harmony and aesthetic balance preserving the cosmetic appeal of the hand.⁶ Surgeries on the hand frequently leaves a large defect which if not replaced by like tissue and if inappropriately sutured tightly will lead to excessive functional loss. Additionally Plastic surgeons work closely with General surgeons, Orthopaedic surgeons, Vascular surgeons, Pediatricians and Hand therapists to ensure comprehensive postoperative care. This collaborative approach allows for a seamless transition from surgery to rehabilitation, optimizing functional outcomes. Taking all these factors into consideration Plastic surgeons are equipped with a holistic and comprehensive skill set required to perform Hand surgeries with the best outcome. Nevertheless, Plastic surgeons must remain at the forefront of recent developments and should continue to update their skills and knowledge to provide the best possible care to their patients.

Conclusion

Despite the tremendous advancements in the field of plastic surgery, there is a limited awareness both among the general public as well as medical professionals regarding the spectrum of work done in plastic surgery. Eventually patients do reach plastic surgeons but after rounds of multiple referrals and in this course of time the window period for various procedures are lost like reimplantation and brachial plexus injuries which leads to the patient suffering his whole life with a lost limb. Hand deformities whether congenital, traumatic, or neoplastic are one of the most debilitating traumas to patients not in terms of functionality but also occupational disability, psychosocial scarring as well as cosmetic concerns. This article tries to establish the role of plastic surgeons in hand surgery which is definitely needed currently along with other modes of awareness so that patients are able to get the required treatment within the specific time frame.



Fig. 3.A. Extensor Tendon injury.



3.B. Post Repair

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Fig. 4.A. Post-traumatic hand defect with exposed tendons. **4.B.** Post groin flap cover



Fig. 5.A Post-traumatic Finger-tip defect. **5.B.** Post-reconstruction with Thenar Flap

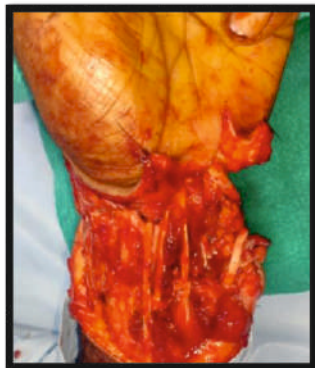


Fig. 6.A. Ulnar Nerve injury. **6.B.** Post Repair



Fig. 7.A. Syndactyly Hand **7.B.** After Release

References

1. Noland SS, Fischer LH, Lee GK, Friedrich JB, Hentz VR. Essential hand surgery procedures for mastery by graduating plastic surgery residents: a survey of program directors. *Plastic and reconstructive surgery*. 2013 Dec 1;132(6):977e-84e.
2. Agarwal JP, Mendenhall SD, Hopkins PN. Medical student perceptions of plastic surgeons as hand surgery specialists. *Annals of plastic surgery*. 2014 Jan 1;72(1):89-93.
3. Kania K, Chang DK, Abu-Ghname A, Reece EM, Chu CK, Maricevich M, Buchanan EP, Winocour S. Microsurgery training in plastic surgery. *Plastic and Reconstructive Surgery Global Open*. 2020 Jul;8(7).
4. Sabapathy SR, Venkatramani H, Bharathi RR, Bhardwaj P. Replantation surgery. *The Journal of hand surgery*. 2011 Jun 1;36(6):1104-10.
5. Thatte MR, Babhulkar S, Hiremath A. Brachial plexus injury in adults: Diagnosis and surgical treatment strategies. *Annals of Indian Academy of Neurology*. 2013 Jan;16(1):26.
6. Johnson SP, Sebastin SJ, Rehim SA, Chung KC. The importance of hand appearance as a patient-reported outcome in hand surgery. *Plastic and reconstructive surgery Global open*. 2015 Nov;3(11).