



ORIGINAL RESEARCH

'Give Me 5 Foundation': A Plastic Surgery Charity Mission Helping to Enhance the Surgical Management of Limb Deformities in Rural India

Benjamin Wood*, Ram M. Chilgar^{†,‡}, Hung-Chi Chen[†] and Fabio Nicoli^{†,§,||,¶}

Aim: A third of the world's disease burden remains amenable to surgical intervention with 5 billion people still lacking access to safe surgery and anaesthesia. Plastic Surgery has the potential to play a key role in enhancing access to safe and effective surgical care. Give Me Five is a no-profit organisation aiming to improve the surgical management of limb deformities in countries with limited resources.

Methods: Based in Shirdi Hospital, Maharashtra, India, a team of worldwide plastic surgeons worked in tandem with local healthcare staff to improve the form and function of patients with limb deformities. A diagonal approach was utilised to ensure sustainability with consideration of all public health, pre-operative, peri-operative and post-operative manners addressed.

Results: Eighty Eight (88) patients were treated over 4 days. The majority (55) were male with an average age of 24 years. 36% of cases involved release of post burn skin contractures with the remaining procedures including microsurgical reconstruction of traumatic brachial plexus injuries, lymph node transfer for lower limb lymphoedema secondary to filariasis as well as syndactyly reconstruction. At 6 months follow up we have had no complications to date with an average hospital stay of 2 days.

Conclusion: Impairment of the limb secondary to trauma, infection or congenital deformity can have a major impact on a patient's physical and psychological health thus impacting daily function. Give Me 5 Foundation is a charity with an aim of improving the surgical burden of disease to the limb in developing countries in a sustainable manner.

Keywords: humanitarian; mission; no profit; organization; extremities; limb

Introduction

Traditionally, the field of Public Health has been centred around the prevention of communicable diseases such as human immunodeficiency virus (HIV) and tuberculosis and that of behaviour such as obesity and diabetes mellitus [10]. Despite the excellent progress we have made with regards to the outlook of such diseases up to 32% of the world's disease burden remains amenable to surgical intervention with 5 billion people still lacking access to

safe surgery and anaesthesia [11]. Following the trend of the inverse care law those typically affected are patients are of poorer groups in society often residing in rural districts [2]. Recognising the need for change and coinciding with the shift towards sustainable development goals the Lancet commission has set a target of 80% coverage of safe surgery and anaesthesia access by 2030 [11].

The field of Surgery, described by [5] as the 'neglected stepchild of global health' has a pivotal role to play in helping both individuals and society fulfil their potential [5]. In fact, it has been highlighted that loss of individual productivity due to surgical morbidity may reduce gross domestic product growth by 2% [2]. The magnitude of the challenge ahead is well recognised with an estimated 143 million additional surgical procedures required to be performed annually to reach the 80% coverage [11].

A well-constructed cost-effective plan, utilising Jugaad principles [8] is thus required in order to create an environment whereby lesser economically developed countries grow under expert supervision. In order to maximise the chances of success as well as ensuring sustainability the aim must be multi-faceted, addressing not only the surgical intervention itself but also the pre-operative arrangements and post-operative follow.

* Department of Orthopaedic Surgery, Pinderfields Hospital, Wakefield, UK

[†] Department of Plastic and Reconstructive Surgery, China Medical University Hospital, Taichung, TW

[‡] Department of Plastic and Reconstructive Surgery, Elrevo Clinic, Aurangabad, IN

[§] Department of Plastic and Reconstructive Surgery, University of Rome "Tor Vergata", IT

^{||} Department of Plastic and Reconstructive Surgery, Newcastle upon Tyne Hospitals NHS Trust, Newcastle upon Tyne, UK

[¶] Department of Plastic Surgery, Ministry of National Guard Hospital, Riyadh, SA

Corresponding author: Fabio Nicoli, M.D.
(dr.fabionicoli@gmail.com)

With an aim of re-establishing both form and function Plastic Surgery has the potential to play a key role in enhancing access to safe and effective surgical care. Amongst the 44 surgical procedures recognised as imperative for a population's health [2] the field of plastic surgery contributes in the management of trauma, burns and congenital deformities [17, 11] all of which can have physical, emotional, social and psychological sequelae. Building on the principles of successful well-established plastic surgery programs such as 'Facing the World' [7] we would like to introduce 'Give Me 5 Foundation', a no-profit organisation aiming to improve the surgical management of limb deformities in countries with limited resources. Both the upper and lower limbs play an integral role in our ability to successfully perform our activities of daily living; aiding our ability to work, communicate, mobilize and maintain adequate nutrition. Until now few organizations have focused on both surgical and microsurgical management of patients with limb defects secondary to congenital deformities, trauma and infection and thus we aim to bridge this gap and ensure efficient and effective surgical access to such patients [14].

Our Mission

In this paper we report the successful surgical treatment of a variety of conditions affecting extremities during a humanitarian mission to India organized by the charitable association "Give Me 5" (www.giveme5.foundation), in collaboration with Indian Society of Plastic Surgery. Our aim is to raise the awareness of the presenting pathology, highlight the associated impact on both individual and society as well as offer cost effective surgical solutions. Furthermore, we want to emphasize the importance of establishing effective collaboration between surgical teams, especially plastic, general and orthopaedic sur-

geons and to cooperate with local government physicians and staff to ensure consistent and sustainable practice.

This is the third international mission performed under the auspices of "Give Me 5 Foundation" a charitable organization set up in 2012 with headquarters in India, Italy and UK. The mission was held in Shri Sainath Hospital, Shirdi, a town situated within the state of Maharashtra, Western India between 19th and 25th March 2018. A holy town famous for its religious leader Sai Baba and production of Sugar Cane it houses a population of nearly 40,000. Strict alcohol and smoking laws within the region have helped to maintain a relatively healthy population however like most states within the country trauma, congenital deformities and filariasis infection with associated lymphoedema cause significant limb morbidity. In addition, due to many women not being able to meet the Dowry requirements, domestic assaults, usually incorporating burns unfortunately remains commonplace. With no formal plastic surgery department within the hospital the majority of the cases are conducted by the general surgery residents.

A worldwide team of plastic surgeons were involved in the mission representing countries of Italy, United Kingdom, Taiwan, Thailand, Singapore and Greece (**Figure 1**). The team worked in tandem with plastic, orthopaedic and general surgeons from India with an aim to leave a sustainable improvement in the surgical management of plastic surgery pathology. A Public Awareness Campaign was started 6 months in advance, with banners and posters positioned in nearby temples highlighting pictures of extremity deformities and injuries amenable to surgical treatment (**Figure 2**). A total of 238 patients with pathologies impairing function and cosmesis reported at the outpatients' clinic before being examined by a local plastic surgeon. The final screening and planning of operations was done on the first day of the mission involving



Figure 1: International team arrived in Shirdi welcome by local authorities.



Figure 2: Public Awareness Campaign using banners and posters highlighting pictures of extremity deformities and injuries amenable to surgical intervention.

the whole international team and patients found suitable were scheduled for surgery in the coming week. Surgeries commenced at 8:00 am and continued till 20:00 pm for 5 days. Every morning and at the end of all surgeries, 1 surgeon and 1 anaesthetist carried out the round to ensure patients were stable both pre and post-operatively respectively.

Results

Eighty-eight (88) patients were treated over four days with the majority jointly managed by both local and travelling surgeons ensuring education provided throughout to trainees (**Table 1**). The operative procedures are greater than the number of cases, as more than 1 procedure was sometimes performed during a single case. The majority (55) were male and the average age of participants was 24 years (range 5–76 years), highlighting the impact made on the most functional members of society. Of the procedures performed 36% (32) involved release of burn contractures of the neck and extremities. Eleven cases of syndactyly of the hand and foot (5 cases bilateral) were performed using standard approach (Brunner incision) and full thickness skin graft from the anterior thigh. Microsurgical procedures were performed on two patients. The first a 21-year-old gentleman with a brachial plexus injury (C5-C6-C7) secondary to a fractured clavicle treated with nerve transfer from spinal Accessory nerve to supra scapular nerve, median nerve fascicle to musculocutaneous nerve and ulnar nerve fascicle to nerve to lateral head of triceps. The other, a 35-year-old female with left leg lymphedema treated with vascularized lymph node flap from the supraclavicular region. The majority of cases were either done using brachial plexus block (27) with or without the addition of spinal anaesthesia or under general anaesthesia (26) with all cases managed by a local anaesthetist. At 6 months follow up we have had

no complications to date and all patients were discharged from hospital within a week (average time stay in hospital 2 days).

Discussion

Surgery is essential for addressing basic health needs and has a significant role to play in the management of both acute and chronic conditions. The increasing demand is consistent across all surgical specialties within the developing world with a projected 5000 more surgical procedures required per 100,000 people in order to try and alleviate the burden of surgical pathology [15].

There are several models recognised to enhance the development of global surgery with [4] highlighting 'vertical (1 way)', 'vertical (2 way)', 'horizontal' and 'diagonal' as potential methods. Vertical routes tend to be an efficient way of managing a specific problem however have the potential to lead to dependence on the expertise of the missionary group [4]. Horizontal methods have the primary target of enhancing the system and ensuring continuity however can be time and cost consuming and highly dependent on local staff to ensure progress. As a result, we tried to utilize a diagonal approach to ensure the benefits of the two described linear methods are obtained while minimizing their potential flaws.

The surgical mission was conducted by a team of international and Indian surgeons working and learning in tandem, with experts in the field providing valuable techniques into microsurgical management of brachial plexus injuries and lymph node transfer for the management of lymphedema. In addition, medical students and junior surgical residents were invited to attend and assist helping to enhance surgical skills and confidence in managing basic plastic surgery procedures such as scar revision and suturing (**Figure 3**).

Partnerships were built with local nurses teaching wound dressing principles while physiotherapists were

Table 1: Procedure Defined Category (Some patients had more than 1 or bilateral procedure and is counted as a single operation).

Body Region	Case type	Surgical procedure*	Anaesthesia**	Total
Head & Neck	Post Burn Contracture (12)	Release & STSG (7)	General (14)	26
	Ectropion (3)	Release & local flap (6)	Local (11)	
	Vascular malformation (3)	Release & Z plasty (4)	Local + SA (1)	
	Scar (3)	Surgical correction (4)		
	Ear malformation (2)	Excision & direct closure (3)		
	Trauma (2)	Release & FTSG (2)		
	Dermatochalasis (1)			
Upper Limb	Post Burn Contracture (12)	Release & STSG (6)	General (6)	17
	Skin Lesion (2)	Release & FTSG (4)	BB (6)	
	Lymphedema (2)	Release & Z plasty (3)	BB + SA (3)	
	Brachial Plexus Injury (1)	Release & local flap (2)	Local (1)	
		Microsurgery (1)	Wrist Block (1)	
		Liposuction (1)		
Hand	Syndactyly (10)	Release & FTSG (7)	BB + SA (10)	23
	Post Burn Contracture (5)	Excision & direct closure (4)	BB (8)	
	Neurofibromatosis (2)	Release & Z plasty (3)	Local (2)	
	Skin lesion (2)	Release + FTSG + K Wire (3)	General (1)	
	Dupuytren (2)	Release & STSG (2)	Wrist Block (1)	
	Trauma (1)	Release & local flap (2)	Digital Block (1)	
	Scar (1)	Release & pedicled flap (1)		
		Tendon transfer (1)		
Genito Urinary	Hypospadias (4)	Surgical correction (4)	Local + SA (4)	7
	Lymphedema (2)	Excision & STSG (2)	General (3)	
	Vaginal atresia + stenosis(1)	Release & local flap (1)		
Soft tissue	Gynecomastia (2)	Liposuction and excision (2)	General (2)	4
	Keloid (2)	Excision & direct closure (2)	Local (2)	
Lower Limb	Post Burn Contracture (3)	Release & Z plasty (2)	SA (4)	8
	Lymphedema (3)	Excision & STSG (2)	RB + SA (2)	
	Post Burn Ulceration (2)	Release & STSG (2)	Local (1)	
		Release & FTSG (1)	Lumbar Epidural (1)	
Foot	Post Burn Ulceration (1)	Debridement & local flap (1)	SA (2)	3
	Syndactyly (1)	Release & FTSG (1)	Digital Block (1)	
	Skin lesion (1)	Excision & direct closure (1)		

*STSG: Split Thickness Skin Graft, FTSG: Full Thickness Skin Graft.

**SA: Sedation, BB: Brachial Block, RB: Regional Block.



Figure 3: Junior doctors were invited to assist helping to enhance surgical skills and confidence in managing basic plastic surgery procedures.

involved to incorporate patients back into society post operatively. Such cooperation of host hospitals and locally active non-governmental organizations provides a sustainable model to provide treatments for extremities reconstruction and infective diseases such as lymphedema.

Filariasis is an infection of the lymphatic tissue spread by mosquitos. Affecting 120 million people worldwide [12], compared to the 38 million suffering from HIV [18], there is now a large paradigm shift into the prevention and cure of this potentially debilitating disease [13]. Although distribution of mosquito nets and anti-helminth medication can prevent and clear infection respectively, the 40 million suffering from incurable lymphedema often require

surgical intervention to improve both form and function (**Figure 4**). The surgical management of lymphedema has excelled exponentially in recent years [16] and offers an alternative to patients not responding the de-congestive therapy. During this mission as well as ensuring the de-congestive therapy clinics are optimized we have been able to educate local clinicians into the art of microsurgery performing lymph node transfers to help treat lower limb lymphedema (**Figure 5A, B**). We have built links and provided opportunities for the Indian plastic surgeons to undertake prestigious fellowships within lymphedema centers in Taiwan ensuring continued professional development.



Figure 4: A case of filarial lymphedema in advanced stage that is routinely seen in our clinic during humanitarian missions.

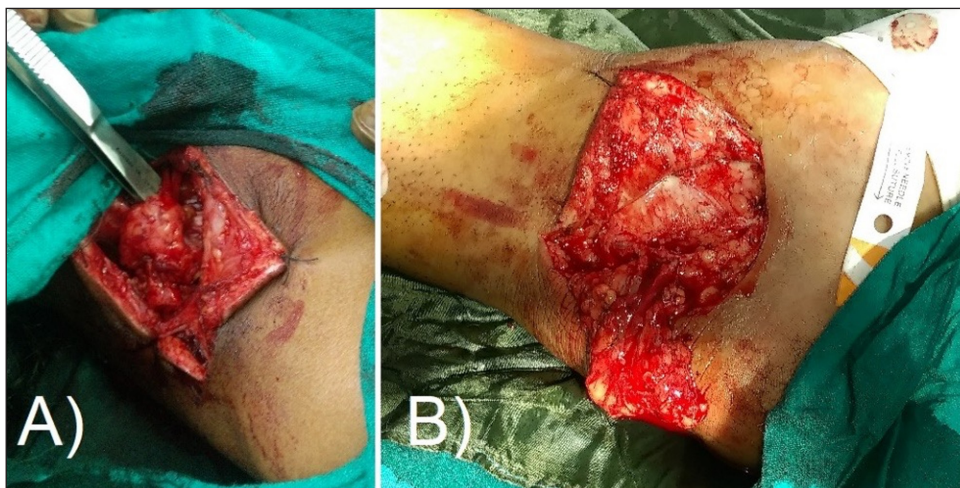


Figure 5: Lymph node transfer procedure for the treatment of filarial lymphedema. **A)** Harvesting of the lymph node flap from the supraclavicular area and **B)** inset to the lower limb.

Reconstruction of extremities represent an important niche with high demand [19]. We have described an efficient model to provide such surgical procedures for patients with limb deformities and are keen to build on current success by collaborating with other organizations to cover the increased demand of global surgery. Furthermore, there are many humanitarian missions in the world where junior or trainee surgeons are encouraged to operate [3]. Recognizing that the participation of junior trainees can result in an increased number of complications [9] we have mentored our junior and local surgeons both from India and the western world strictly under supervision of an experienced surgeon. This ensured training was provided throughout the mission, maintaining trainee enthusiasm, enhancing interest and knowledge surrounding global surgery [1, 6] whilst also maintaining minimal complication rates.

Conclusion

Impairment of the limb secondary to trauma, infection or congenital deformity can have a major impact on a patient's physical and psychological health thus impacting daily function. Give Me 5 Foundation is a charity with an aim of improving the surgical burden of disease to the limb in developing countries in a sustainable manner.

Acknowledgements

We would like to thank all the participants involved in this humanitarian project who dedicated their time and offered their professional skills free of charge for all our patients. In particular, we are grateful to the Shirdi hospital for agreeing to participate in this research and providing infrastructure, staff at work and accommodations for International staff and patients families. In particular we express our gratitude to the Indian Society of Plastic Surgery to support our project and endorse our initiative and thank all the staff of "Give me 5" No Profit organization www.giveme5.foundation. We would also like to thank Dr. Kidakorn Kiranantawat, Dr. Matthew Sze-Wei Yeo, Dr. Michele Maruccia and Dr. Stamatis Sapountzis for their expertise and guidance during this mission.

Funding Statement

There was no funding received for this paper.

Competing Interests

The authors have no competing interests to declare. Fabio Nicoli and Ram M. Chilgar are founders and coordinators of Give me 5 Foundation. Benjamin Wood is secretary and coordinator of UK branch.

Author Contribution

All authors were present at the mission and contributed to research surrounding the topic of global surgery. All authors contributed to the writing of this article.

Guarantor

Ram M. Chilgar is the guarantor.

Peer Review

This is a non-commissioned paper that has undergone external peer review according to journal policy.

References

1. **Aziz, SR, Ziccardi, VB and Chuang, SK.** Survey of residents who have participated in humanitarian medical missions. *J Oral Maxillofac Surg.* 2012; 70: e147–573. DOI: <https://doi.org/10.1016/j.joms.2011.10.007>
2. **Broer, P, Jenny, H, Ng-Kamstra, J and Juran, S.** The Role of Plastic Surgeons in Advancing Development Global. *World J Plast Surg.* 2016; 5(2): 109–113. DOI: <https://doi.org/10.1097/SAP.0000000000000807>
3. **Campbell, A, Sherman, R and Magee, WP.** The role of humanitarian missions in modern surgical training. *Plast Reconstr Surg.* 2010; 126: 295–302. DOI: <https://doi.org/10.1097/PRS.0b013e3181dab618>
4. **Chung, K.** Plastic and Reconstructive Surgery in Global Health: Let's Reconstruct Global Surgery. *Plast Reconstr Surg Glob Open.* 2017; 5(4): e1273. DOI: <https://doi.org/10.1097/GOX.0000000000001273>
5. **Farmer, PE and Kim, JY.** Surgery and global health: A view from beyond the OR. *World J Surg.* 2008; 32: 533–6. DOI: <https://doi.org/10.1007/s00268-008-9525-9>
6. **Jacobs, MJ, Young, SC and Mittal, VK.** Benefits of surgical experience in a third-world country during residency. *Curr Surg.* 2002; 59(3): 330–2. DOI: [https://doi.org/10.1016/S0149-7944\(01\)00624-9](https://doi.org/10.1016/S0149-7944(01)00624-9)
7. **Kirkpatrick, N, Ong, J, Driver-Jowitt, S and Eccles, S.** Facing the World: The evolution of a craniofacial charity. *Ann Plast Surg.* 2013; 70(2): 127–30. DOI: <https://doi.org/10.1097/SAP.0b013e31822510b0>
8. **Kumar, V, Jacob, P, Kekatpure, V, Hedne, N, Koch, F, et al.** The Jugaad Technique for Jaw Reconstruction: Denture Based Inverse Planning. *J Maxillofac Oral Surg.* 2016; 15(3): 346–348. DOI: <https://doi.org/10.1007/s12663-015-0845-7>
9. **Maine, RG, Hoffman, WY, Palacios-Martinez, JH, et al.** Comparison of fistula rates after palatoplasty for international and local surgeons on surgical missions in Ecuador with rates at a craniofacial center in the United States. *Plast Reconstr Surg.* 2012; 129: 319e–326e. DOI: <https://doi.org/10.1097/PRS.0b013e31823aea7e>
10. **McCarthy, M, Harvey, G, Conceicao, C, la Torre, G and Gulis, G.** Comparing public-health research priorities in Europe. *Health Res Policy Syst.* 2009; 7(17). DOI: <https://doi.org/10.1186/1478-4505-7-17>
11. **Meara, J, Leather, A, Hagander, L, Alkire, B, Alonso, N, et al.** Global Surgery 2030: Evidence and solutions for achieving health, welfare, and economic development. *Lancet.* 2015; 8, 386(9993): 569–624. DOI: [https://doi.org/10.1016/S0140-6736\(15\)60160-X](https://doi.org/10.1016/S0140-6736(15)60160-X)
12. **Nutman, T.** Insights into the pathogenesis of disease in human lymphatic filariasis. *Lymphat Res Biol.* 2013; 11(3): 144–8. DOI: <https://doi.org/10.1089/lrb.2013.0021>

13. **Ottesen, E.** Lymphatic filariasis: Treatment, control and elimination. *Adv Parasitol.* 2006; 61: 395–441. DOI: [https://doi.org/10.1016/S0065-308X\(05\)61010-X](https://doi.org/10.1016/S0065-308X(05)61010-X)
14. **Roh, Y.** Clinical evaluation of upper limb function: Patient's impairment, disability and health-related quality of life. *J Exerc Rehabil.* 2013; 9(4): 400–405. DOI: <https://doi.org/10.12965/jer.130060>
15. **Rose, J, Weiser, T, Hider, P, Wilson, L, Gruen, R,** et al. Estimated need for surgery worldwide based on prevalence of diseases: A modelling strategy for the WHO Global Health Estimate. *The Lancet.* 2015; 3(52). DOI: [https://doi.org/10.1016/S2214-109X\(15\)70087-2](https://doi.org/10.1016/S2214-109X(15)70087-2)
16. **Sapountzis, S, Ciudad, P, Lim, SY, Chilgar, RM, Kiranantawat, K, Nicoli, F, Constantinides, J, Wei, MY, Sönmez, TT, Singhal, D and Chen, HC.** Modified Charles procedure and lymph node flap transfer for advanced lower extremity lymphedema. *Microsurgery.* 2014; 34: 439–47. DOI: <https://doi.org/10.1002/micr.22235>
17. **Semer, N, Sullivan, S and Meara, J.** Plastic surgery and global health: How plastic surgery impacts the global burden of surgical disease. *J Plast Reconstr Aesthet Surg.* 2010; 63(8): 1244–8. DOI: <https://doi.org/10.1016/j.bjps.2009.07.028>
18. **Simon, V, Ho, D and Karim, Q.** HIV/AIDS epidemiology, pathogenesis, prevention, and treatment. *Lancet.* 2006; 5, 368(9534): 489–504. DOI: [https://doi.org/10.1016/S0140-6736\(06\)69157-5](https://doi.org/10.1016/S0140-6736(06)69157-5)
19. **Tadisina, KK, Chopra, K, Tangredi, J, Thomson, JG and Singh, DP.** Helping hands: A cost-effectiveness study of a humanitarian hand surgery mission. *Plast Surg Int.* 2014. Available from: <https://www.hindawi.com/journals/psi/2014/921625/>.

How to cite this article: Wood, B, Chilgar, RM, Chen, H-C and Nicoli, F. 'Give Me 5 Foundation': A Plastic Surgery Charity Mission Helping to Enhance the Surgical Management of Limb Deformities in Rural India. *International Journal of Orthoplastic Surgery.* 2018; 1(3), pp. 94–100. DOI: <https://doi.org/10.29337/ijops.21>

Submitted: 01 October 2018

Accepted: 15 October 2018

Published: 05 December 2018

Copyright: © 2018 The Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC-BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited. See <http://creativecommons.org/licenses/by/4.0/>.



International Journal of Orthoplastic Surgery is a peer-reviewed open access journal published by IJS Publishing Group.

OPEN ACCESS