Interplast Italy: A 20-Year Plastic and Reconstructive Surgery Humanitarian Experience in Developing Countries

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Background: Interplast Italy is a nongovernment, nonprofit organization with the aim of providing high-quality standard reconstructive procedures, contributing to local medical and nursing education, in those countries where this is not available or where the local resources are inadequate to meet local needs. A recent debate about the real aim and the effectiveness of this kind of health support strategy in developing countries has been raised.
Methods: The authors report a 20-year experience, explaining operative strategy, activities, and results, and contributing to the development and improvement of the philosophy of humanitarian missions.
Results: Since 1988, 47 missions and 5235 operations have been performed. A total of 2286 patients (43.7 percent) were younger than 18 years, and 2949 (56.3 percent) were above that age. Congenital cleft deformity was the most common diagnosis in 2415 patients (46.13 percent). Patients suffering from postburn contractures were operated on in 1956 cases (37.36 percent). The number of postburn children operated on was 922 (17.6 percent).
Conclusions: Cooperation with local physicians is considered mandatory to guarantee adequate patient preselection, to organize the activity in situ, and to plan continuous effective work on a regular basis to build local capacity and facilitate sustainable models for health care. Furthermore, as local surgeons become interested in reconstructive surgery, continuous teaching through a multidisciplinary approach must be paramount. The activity of Interplast Italy contributed to building a plastic surgery service in Bangladesh. Combined multidisciplinary activities linked to established organizations such as the Interplast confederation are desirable to improve results. A link with structured organizations is needed to obtain financial resources to extend targets and to improve activities and outcomes. (*Plast. Reconstr. Surg.* 124: 1340, 2009.)

Interplast Italy is a nongovernment, nonprofit organization founded in Bologna, Italy, in 1988 with the aim of providing high-quality standard plastic and reconstructive procedures in developing countries and contributing to local medical and nursing education. Interplast's purpose is to offer modern reconstructive surgical practice, experience, and support in those areas of the world where it is not available or where the local resources are inadequate to meet local needs.

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In 1988, the first mission was carried out after the request of the bishop of Dhaka, in Bangladesh, who visited Bologna and met a child who had a surgical repair of a cleft lip and palate malformation. Knowing that there were many people affected by this kind of pathology who did not receive adequate treatment in his country, he developed a cooperative program with the plastic surgeons from Bologna that is still ongoing every alternate year. At that time, an organization named Interethnos was created. Since that first mission,

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two to four times per year, a plastic surgery team spends its time, effort, and resources to bring and spread reconstructive surgery in those areas where this is not available and the need of support and collaboration is strong.

In September of 1991, in San Francisco, California, Dr. Donald Laub, professor at Stanford University, in Palo Alto, California, and founder of Interplast Inc., USA, included Interethnos within the "worldwide confederation of Interplast." Since that time, the name "Interplast Italy" has been adopted. Recently, the activity of the organization has been enlarged due to the collaboration with various universities in Italy.

With the supervision of experienced academic surgeons, it has become a truly useful instrument for humanitarian aims, medical education, surgical training, and cultural exchange for the local population and local and overseas junior doctors in those areas where the lack of medical and surgical care facilities is a serious problem. During these years, Bangladesh, Togo, Albania, China, Honduras, Zambia, Nepal, Kurdistan, Thailand, Northern India, Tibet, Bolivia, and Peru have been visited by Interplast Italy missions (Fig. 1).

A recent debate about the real aim and the effectiveness of this kind of health support strategy in the developing countries has been raised.[1] We report a 20-year experience, explaining operative strategy, activities, and results, contributing to the development and improvement of the philosophy of humanitarian missions in plastic and reconstructive surgery.

MATERIALS AND METHODS

The humanitarian aim of Interplast Italy missions is to provide free reconstructive surgery, to increase and enlarge host-country medical care and educational programs, and to improve health care in developing countries worldwide. The objectives of the organization's activities are to:

1. Provide direct patient care and ancillary services to those areas with no other resources.
2. Provide educational training and medical exchange.
3. Assist host-country surgeons, anesthesiologists, and nurses toward medical independence.

Interplast Italy activity is based on a free voluntary partnership of plastic surgeons, anesthesiologists, pediatricians, and specialized surgical and intensive care nurses with the shared goal of helping, supporting, educating, and empowering local communities to provide competent, safe, and available reconstructive surgical services.

Interplast Italy has no political or religious affiliations. As with many other humanitarian organizations, it is structured with a president, secretary, and members. There are four committees for the management of medical, surgical, anesthetic, nursing, and organizing activity for each single mission. The missions themselves are planned during the previous year at least 6 to 12 months before the departure date. Before taking an active surgical role in the host country, some points must be considered.

First is the need for establishing contacts with the local community to create a link with a local hospital providing basic surgical resources and selection of patients.

Second is the need for providing financial support and surgical equipment. Due to free healthcare providers and considering costs for equip-

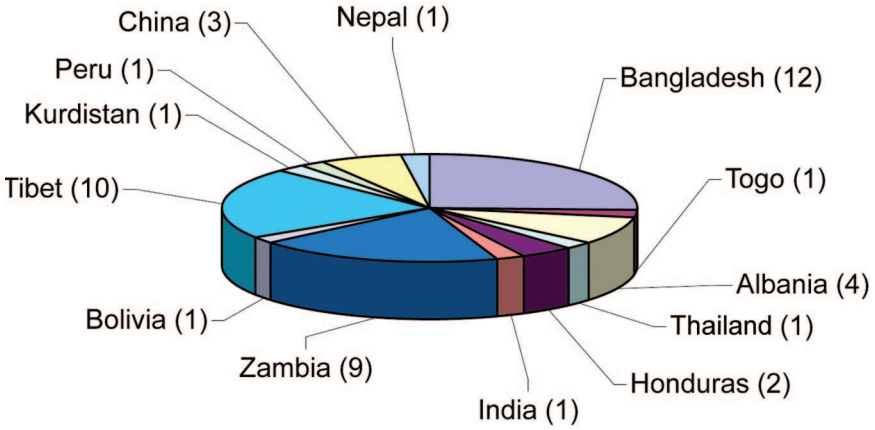

Fig. 1. The 47 missions performed by Interplast Italy in 13 nations during the period between December of 1988 and December of 2007.

ment, Interplast Italy can perform a cleft lip and palate reconstructive procedure for 260 euros, burn scar correction for 160 euros, and provide dressings and medications for 26 euros. Interplast Italy volunteers organized a very intensive continuous network to provide financial support through meetings, charity activity, and single donations. An annual contribution of 10,000 euros is provided by the Italian Society of Plastic, Reconstructive, and Aesthetic Surgery for Humanitarian Charity Missions in Plastic Surgery.

Third is the need for contacting healthcare companies to obtain as much equipment as possible with the lowest charges. All surgical and anesthetic equipment, including suture material, specific drugs, and dressings, is provided by the organization, while the local host hospital is asked to offer a sufficient number of beds and one to three operating tables, without interfering with the local routine hospital service. The local host also usually provides accommodation and transport. In those areas already known, local physicians preselect the candidates for surgery.

Two types of missions have been performed since Interplast Italy started its activity. One is the pilot mission, which is carried out in areas where the local contacts are new and the local resources are still unknown in terms of potential growth of local doctors and patients' needs. This type of mission is usually carried out by a "micro-team" composed of two plastic surgeons, one anesthesiologist, and two specialized nurses. The role of this team is very important for planning a future activity in a new area, starting surveillance, and monitoring local resources and patient selection. The other type of mission is carried out in areas where local resources and patient availability are well known and a larger number of components (eight to 14 staff comprising two to four surgeons, two to three anesthesiologists, three to five nurses, and one to two pediatricians) could be available to increase the number of procedures, teaching, and patient care (macro-team). An academic link with universities in Italy and the Italian Society of Plastic Surgeons provides at least two professors of plastic surgery for each macro-team. A single operative team includes at least a senior surgeon, a local or overseas junior surgeon, and a specialized theater nurse. This opportunity offers excellent educational and teaching activity for local and overseas assistants. Lectures are given to the local doctors on a regular basis.

Every mission lasts for 2 to 3 weeks, based on the needs and resources of the local hospital. All equipment is sent from Italy at least 2 months in advance. Surgical sessions start on the second day after the arrival, after a day of patient screening, selection, and care. Usually more than 200 patients, who have been previously selected by the local doctors, come from the entire region to undergo an accurate consultation with the local physicians and then with the overseas reconstructive team. Usually, 9 to 14 operating days are planned within one mission, and 50 to 250 patients undergo surgery after selection, according to time and resource availability. During the first consultation, every patient is assessed with a clinical photograph and a personal medical file. On each surgical table, a senior surgeon and a local and an overseas assistant perform the surgery. A hospitalization area with 15 to 30 beds is usually required for preoperative and postoperative care. We operate on the most severe cases at the beginning of the mission to provide postoperative care ourselves. Our surgeons and anesthesiologists are available 24 hours a day in case of complications. We postpone the less severe cases to the last days of our stay, as the local surgeons are then trained to deal with possible complications and medications. Two half sessions per week are entirely dedicated to teaching and education for local medical and nursing staff.

RESULTS

Since 1988, 47 missions have been performed, and 5235 patients have been operated on (Table 1). There were 2177 male patients (41.6 percent), and 3058 female patients (58.4 percent). A total of 2286 patients (43.7 percent) were younger than 18 years old, and 2949 (56.3 percent) were above that age.

Congenital cleft malformation was the most common diagnosis in 2415 patients (46.13 percent of all operated patients). The subdivision is as follows: cleft lip, 1086 (45 percent); cleft palate, 387 (16 percent); and cleft lip and palate, 942 (39 percent). Of all patients with clefts, 1199 (49.6 percent) were children younger than 2 years old. This number represents 22.9 percent of all patients operated on during these 20 years. It was not uncommon (about 20 percent of all clefts) to operate on cleft malformations in patients older than 18 years old, which is very rare in our country. Moreover, 507 cases (21 percent) of cleft malformations operated on were secondary procedures as refinement or correction of deformities previously operated on by other surgeons (Fig. 2). On the other hand, about 5 percent (113 patients) were secondary procedures performed on patients operated on by our team in previous missions (Fig. 3).

Table 1. Summary of the 47 Missions of Interplast Italy between December of 1988 and August of 2007

Year	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Nation	Ban	Ban	Ban	Ban	Togo	Alb	Hon	Alb	Thai	India	Bol	Zam	Hon	Tibet	Alb	Kurd	Peru	Tibet	China	China
No. of patients	75	104	95	104	51	90	76	82	102	75	75	78	75	170	135	278	144	160	250	137
<18 years	27	41	37	36	26	56	38	49	20	20	38	39	28	59	55	159	46	81	118	55
>18 years	48	63	58	68	25	34	38	33	82	55	37	39	47	111	80	119	98	79	132	82
No. of clefts	44	60	51	54	13	25	38	30	72	54	33	14	45	102	52	77	55	33	119	66
No. of burns	25	32	29	33	25	41	20	40	18	0	28	50	18	56	52	120	32	121	85	39
No. of other	6	12	15	17	13	24	18	12	12	21	14	14	12	12	31	81	57	6	46	32
Nation					Alb	China	Ban	Zam	Zam	Zam	Zam	Tibet	Zam	Zam	Tibet	Zam	Zam		Tibet	Tibet
No. of patients					63	72	165	65	85	72	88	65	81	92	90	63	77		250	121
<18 years					43	12	66	25	34	28	42	20	36	41	25	33	37		94	86
>18 years					20	60	99	40	51	44	46	45	45	51	65	30	40		156	35
No. of clefts					15	50	98	18	27	19	17	29	19	19	56	18	18		159	66
No. of burns					33	18	52	43	50	38	62	25	62	55	25	29	45		66	44
No. of other					15	4	15	4	8	15	9	11	0	18	9	16	14		25	11
Nation					Ban			Nepal	Ban	Tibet	Tibet		Tibet		Ban		Tibet		Ban	
No. of patients					75			95	135	54	67		93		177		165		138	
<18 years					28			45	48	9	26		50		67		79		61	
>18 years					47			50	87	45	41		43		110		86		77	
No. of clefts					49			33	72	39	39		45		81		90		79	
No. of burns					20			33	36	0	16		35		71		70		44	
No. of other					6			29	27	15	4		13		25		5		15	

Ban, Bangladesh; Alb, Albania; Hon, Honduras; Thai, Thailand; Bol, Bolivia; Zam, Zambia; Kurd, Kurdistan.

Fig. 2. December of 2004, Dhaka, Bangladesh. A 9-year-old female cleft-lip patient operated on for secondary procedure. Preoperative and immediate postoperative views. Our little patients receive small gifts from the nurses. (*Left*) This girl kept hugging the kitten she had just received for the entire surgery. (*Right*) After the surgery, the girl is still holding onto her gift.

Fig. 3. August of 2000, Lhasa, Tibet. An 11-year-old patient affected by severe postburn sternal-chin contracture. The patient was treated with multistage procedures with full-thickness skin grafts in different missions (August of 2000, August of 2001, and August of 2002). Two years from the first surgery, he came back for a third time to treat the scars on his thorax. This case stresses the importance of guaranteeing continuity in the missions and the significance of the cooperation with local physicians who are the ones able to alert and gather the patients selected throughout the year for the 2 weeks of our stay.

Patients suffering from postburn contractures were operated on in 1956 cases (37.36 percent of all patients operated on) during these 20 years. The number of children under 18 years old operated on after sustaining burns was 922 (47.1 percent). This represents 17.6 percent of all patients operated on in all 47 missions. Other congenital or acquired deformities and tumor excisions numbered 864 (16.5 percent) of all treated patients. Since the first mission, teaching hours have always been performed on a regular basis.

The teaching sessions have continuously increased within the recent missions, and since the year 2000, about 1 to 2 hours per day are dedicated to lectures on specific topics and interactive clinical case-based sessions. Furthermore, during all surgical procedures, the most experienced sur-

geons provide continued teaching, and 20 percent of the cases have been carried out by the local surgeons under the direct supervision of a scrubbed tutor.

We have a record of more than 20,000 clinical pictures (Figs. 4 and 5). More than 4000 hours of digital recordings have been taken since the year 2000, and five professional film documentaries have been created as direct support in advertisements for financial recruitment.

Since our activity started in Bangladesh, a new plastic and reconstructive surgery service has been created in Dhaka and recently renovated with four independent surgeons and a staff dedicated to burned patients and general plastic surgery (Fig. 6). More is needed to achieve complete independence within cleft and palate surgery. Development of this subspecialty together with the treatment of congenital abnormalities of external genitalia is now our next aim. In Tibet, a plastic surgery service is now ongoing, as in Zambia, and independent support from local physicians has been well established. All other countries are still far from the target achieved in those countries.

DISCUSSION

Humanitarian missions in developing countries are often burdened with a shortage of means and materials.[2–8] A prerequisite of any mission is trying to offer in all medical procedures the same operating standards applied in developed countries. It is essential for the entire campaign to

Fig. 4. December of 2002, Dhaka, Bangladesh. Three-year-old patient with Tessier cleft no. 8. Correction with rotation and advancement cheek flaps.

Fig. 5. January of 2004, Cajamarca, Peru. A 32-year-old female patient operated on for correction of severe left unilateral cleft lip and palate.

Fig. 6. Interplast Italy's last mission in Dhaka, Bangladesh, in 2007. Prof. Morselli is the first on the left.

identify suitable local hosts and to establish a consolidation process for fund raising. It is also necessary to ship, at least 2 months in advance, all the required medical equipment, as it will be the only resource accessible on location. After 20 years of experience, Interplast Italy considers as an essential priority the support of the local physicians on whom we rely during the missions in these countries. This point represents the real key for a successful mission in terms of providing patient health care and reaching the goal of teaching plastic and reconstructive surgery in countries where this specialty is lacking.

The guidelines for our reconstructive surgical expeditions in developing countries are both to operate on as many patients as possible related to the available time set and to teach the basic surgical techniques to the local and overseas junior surgeons to give continuity to the efforts made during these years.

The more experienced reconstructive surgeons should always be assisted by local surgeons, and they should be very willing to share their knowledge and experience with them, performing difficult operations on locally preselected patients and also scheduling interactive lessons on those general and specific topics that local surgeons will encounter the most in their future practice. Instead, many well-intentioned groups send surgical expertise to disadvantaged regions without achieving the expected results. This is mainly due to lack of cooperation and does not provide proper postsurgical care with adequate teaching and education. Interplast Italy is trying to develop an action model based on an old philosophy initially developed for cleft care: that simple surgical intervention alone can produce quality outcomes.[9–12]

We remark that cooperation with the local physicians is mandatory to guarantee correct preselection of patients for surgical treatment, to organize the activity, and to plan continuous efficient work on a regular basis. It is very important to start with local contacts to perform an initial assessment by sending an experienced small team (micro-team) or a "pre-trip" experienced observing surgeon, and then to continue with more extensive action through a wider team including interested and well-trained junior surgeons to give continuity to the activity and to enlarge the scope of the missions.[13] Furthermore, as local surgeons in developing nations become interested in reconstructive surgery and, of course, in cleft surgery, teaching local surgeons through a multidisciplinary approach must be paramount. Patient safety must be guaranteed at all stages.

Follow-up of the patients remains a challenge during the humanitarian missions. Often the patients come from very remote and rural parts of the host country, and even contact between them and the local medical staff can be difficult to establish.

The major technical drawbacks of this kind of surgical activity still remain, with a relatively high rate of infections (<12 percent) during the early postoperative period and the limited rehabilitation program.[14,15] In many countries, despite the wide use of antibiotic prophylaxis and therapy, hygiene conditions are often poor, and even if good antibiotic coverage is administered, it is not enough to sufficiently protect a significant percentage of the patients.[16,17]

Through all of these years of humanitarian activity, we report better results in those countries where our presence is more frequent and the established cooperation with the local resources allows better medical action, as in Bangladesh, Tibet, and Zambia. Our efforts are now directed toward improving specific subspecialties within these services. In the other countries, collaboration with the local surgeons is developing a good

level of independence within the plastic surgery service, but lack of local financial resources is affecting the speed of the process. More needs to be done, and our activity is increasing in this direction.

We noticed a different epidemiology of the diseases in the different world areas. Burn sequelae are the most frequent pathology encountered, followed by facial malformations.[18] Children suffered from flame burns more in certain areas, such as Tibet, Bangladesh, and the north of Peru, where fires are lit on the ground and without any barriers can be easily reached by these young patients. Scald burns in children are common in China and Tibet due to the boiled food tradition. Women suffered burns more frequently than men, probably due to more time spent in the kitchen. Acid burns in women are very frequent in Bangladesh due to an old custom of punishment for suspected adultery.[19]

Microsurgery, as reported by some authors,[14,15] did not find a useful role in our missions. This was because in the countries we visited the local medical staff was not sufficiently trained and the technical resources were limited. At the present time, without these two fundamental elements, we feel the standard of our activity can not be maintained.

Plastic surgeons or residents who are interested in this kind of pioneering work in reconstructive surgery are recruited on the basis of strict selection and offered a unique opportunity to see a different world and to be helpful, improving their knowledge and experience. Compared with other organizations, Interplast Italy recruits its volunteers on a basis of a psychological attitude, medical skills, and a teamwork mindset, supported by the personal reference from three members of the staff. During the past 20 years, this strict selection, however, has not affected the recruitment of new participants and the outcome of our surgical activity. Moreover, the humanitarian and voluntary drive of these missions helps to transform individual efforts into a wider program multiplying resources and results. As a junior resident stated when he joined our team for the first time in Bangladesh, "I never worked so hard, and with this determination. It was such an inspiration."

During these years, we did not encounter any problems in recruiting motivated and skilled doctors and nurses to volunteer to operate in these countries. The main difficulty was in obtaining all the necessary finances and equipment to guarantee a successful mission. Because we have become members of the Interplast confederation,[20] this has been a definitive step forward in the constant search for funding resources. Being a part of an established international organization gave us credibility and trust, making the fundraising process easier. Another important advantage in belonging to the Interplast confederation is the opportunity to follow guidelines and share common experience. Our report is the result of a strategy in humanitarian aid that arose from this experience. This link helped us to improve our action plans, to maintain autonomy in the organization process, and to develop local reconstructive surgery independence, reducing the risk of medical colonialism.

Combined multidisciplinary activities linked to established organizations such as the Interplast confederation are desirable to improve results. A link with structured organizations is needed to obtain financial resources, to extend targets, and to improve activities and outcomes. Our achievements are still small in comparison with the large scale of need, and other voids of aid will have to be filled in the future.

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