

ORGANIZATION OF PLASTIC SURGERY IN DEVELOPING COUNTRIES

'Gillies Memorial Lecture'

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I am deeply appreciative of the honour that has been bestowed on me to deliver the Gillies Memorial Lecture on the birth centenary of the father of modern plastic surgery.

I feel Sir Harold Gillies would have appreciated the theme of this lecture, as he was not only interested in developing the principles and techniques of plastic surgery but also in their dissemination, for what is the use of knowledge and skills if they cannot serve those who need them. This was the reason for his two visits to India in 1957 and 1959 on the eventide of his life. Plastic surgery in India owes a great debt to him for his tireless effort in promoting this speciality throughout the country and giving it the initial momentum. He was the chief guest at the inauguration of the Association of Plastic Surgeons of India at Nagpur in 1957. It is therefore befitting that our Association also has a memorial lecture in his name.

At the onset, it is essential to identify the role of plastic surgery in a developing country, the needs of which must necessarily differ from those of western nations. The primary role of plastic surgery in India must be the treatment of congenital deformities and defor-

mities resulting from accidents and conditions like leprosy and filariasis, not craniofacial surgery or reattachment of digits.

The past 25 years has been a dramatic increase in the number of plastic surgeons and plastic surgery units in the country, yet this speciality, like almost all other aspects of our health services has by and large failed to reach the majority of our people who live in the half million villages of our country.

Instead of assigning blame it behoves us to analyse the cause of this failure which affects the entire medical profession and the society of which they are a part. Modern society like the human being is a complex organism comprising of a multitude of individual parts all of which are closely inter-related. Malfunction of any part can disturb the harmony of the whole body. There is always the danger that the specialist by the very nature of his training sees his subject in isolation. It is therefore important to see plastic surgery in its proper perspective; that it is only a small part of surgery which is an even smaller part of medicine; that medicine itself is only a part of the whole social system.

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Despite a ten-fold increase in hospitals, medical colleges, doctors, nurses and paramedicals and over a hundred-fold increase in the production of drugs, 80% of the people continue to have no access to any meaningful form of health care 35 years after India's independence. It also explains the lowly status of preventive medicine as compared to that of the clinical subjects. The emphasis in both the private as well as the public sector is on the latest curative technology centred around urban hospitals while neglecting to provide the most elementary services to the rural population.

India was fortunate that at Independence it had the Bhore Committee's report. Its emphasis was on the preventive and promotive aspects of health based within the community and where people were to be active participants. Supportive referral services were advocated in a graded manner from the Primary Health Centre and the District Hospital to the urban apex centres. A more recent study undertaken by the Indian Councils of Medical and Social Science Research reiterates these basic principles and suggests a viable alternative pattern for the delivery of health care. It states that the problems of the people, including the major killing and maiming diseases can be best looked after by the community itself when given some training, encouragement and support. For problems requiring more specialised skills and facilities a graded referral system is indicated.

The alternative model can be summed up as follows :

A large percentage of the preventive and simple curative problems

should be dealt with by the people themselves with the help of their own Community Health Worker, supported by a paramedical worker at the sub-centre situated within the group of villages. The key-stone of this model is the Community Health Centre serving 100,000 population or 20 subcentres. It is the focal point of all health activities of the community ; promotive, preventive and curative. The curative service would comprise of a hospital with adequate basic facilities of pathology, x-ray and operation theatre manned by a general surgeon, physician, paediatrician and a gynaecologist. Such a hospital should be capable of dealing with the vast majority of the general surgical problems as well as the common problems of most specialities, including plastic surgery. This will leave only a small load of difficult cases for the District hospital which will serve 10 Community Health Centres, and only accept cases referred by these centres. It will have specialist facilities including those for plastic surgery. For every five District Hospitals there will be a medical college and also an apex centre for each speciality.

Such a model has several advantages :

- (a) It would be cost effective by ensuring the matching of skills and facilities at each level of requirement.
- (b) It would be most convenient and accessible to the people it has to serve as it is based within the community itself.

- (c) It seeks to maintain the close inter-personal ties between the people and the professionals which is so important in traditional communities.
- (d) It optimizes the use of the limited specialist skills and facilities which the country can afford.
- (e) It is a self-contained unit with its own medical college and specialist centres. These in turn are closely knit with the peripheral units and function as one entity. There is a built in system of continuous exchange of information and in-service training.

It is natural that the broad base of such a health pyramid, which is located with the community should get the priority for allocation of manpower and resources. Unfortunately, as things exist this pyramid has been stood on its head. There are more doctors than nurses or paramedicals and a surfeit of specialists as compared to general practitioners. Today we have an urban based curative service centred around the hospital and clinic which absorbs the majority of available resources and is accessible to only a very limited segment of the population. This model has been designed by the professionals and specialists who are its main beneficiaries.

Under the prevailing circumstances plastic surgery, when practiced as a narrow speciality, is oblivious not only to the health and general surgical problems of the country but also to the majority of the plastic surgery problems which lie in the rural areas and go unnoticed and unattended. The distortion in

priorities even within our speciality is revealed by the emphasis on microvascular and craniofacial surgery while widespread problems like those of burns and leprosy receive low priority. It is understandable that majority of the surgeons will be enamoured by the latest techniques but there are only a minuscule part of the speciality and the least of our problems. Can a country with limited resources afford the luxury of satisfying the professional desires of its surgeons who are trained at high cost to the public exchequer?

The problem of plastic surgery in the tropical countries is often very different from those seen in the West. This is not only because of the prevalence of diseases like cancerum oris, filariasis or leprosy but also because of the severity of deformities as a result of late diagnosis and inadequate treatment. In addition there are problems like those of malnutrition and anaemia as well as social, cultural and economic problems and those of communication and transport over long distances. It would be unrealistic to think of orthodontia in a child coming from a distant village with cleft lip and palate or of multistaged ear reconstruction for microtia. Deformities like syndactyly or portwine stains are not only accepted but are often considered a sign of divine favour in some cultures and there is no need to change such concepts especially when there is so much else to do. It is evident that the majority of these cases will not be able to avail of the present urban centred health system. Would not the alternative system be more effective under these conditions?

In this new model there will exist an apex centre of plastic surgery for every 5 million population. Its task will be to ensure that this population will receive the optimum benefits of our speciality under the prevailing conditions and constraints. Their approach will be based on an epidemiological study of the plastic surgery problems of the area like the types of disease and deformity, their incidence, distribution of population and transport facilities. On the basis of the findings will be devised a system of filtration of both acute and cold cases so that wherever possible the problems will be looked after within the community at its own hospital, leaving only a decreasing load of more difficult and complicated cases to be transferred to the plastic surgeon at the district hospital. The apex unit will be responsible only for the care of those requiring the highest plastic surgical skills and facilities. Equally important will be its responsibility for the training of all personnel in the area who will have to deal with the problems of plastic surgery. This will not only include the training of plastic surgeons who will service the five district hospitals but also provide basic plastic surgery training to all the general surgeons who will eventually man the 50 Community Hospitals of the area for it is they who will be responsible for taking the major routine load. It is unrealistic to expect specialists for every 100,000 population in these countries, at least in the foreseeable future. There should however be a constant flow of visiting specialists from the district to the community hospitals to provide support, in the form of pre and post operative consultation, selection of cases for transfer to the district or apex

hospital, assisting in surgery and providing on the job refresher training.

The key to such a model is simplification and peripheralization of services as far as is possible as well as constant training and support to the basic medical services within the community. It is more practical and far cheaper for a consultant to travel to the periphery than expect a multitude of patients to make their way to a distant centre. It also ensures better patient-doctor rapport, early detection and treatment and regular follow-up. It would also permit close interaction and cooperation between the specialist and the general surgeon and better appreciation of each others' view points. There would be no better way of ensuring continuous exchange of information and training and relieving the professional and intellectual isolation of the staff in the peripheral centres. It would also ensure that the specialist is kept in touch with the reality of the problems that face most of population.

Let us now examine the extent to which plastic surgery can be simplified. It is almost a universal rule that yesterdays speciality is tomorrow's routine whether it be driving a car, using a computer, cutting a Thiersch graft, repairing a cleft palate or raising a tube pedicle. Without it there would not be any progress.

The role of any speciality should be to pioneer in its own field and to simplify new knowledge and technology which it can then pass on to the general surgeon or physician or even the general practitioner. This leaves it the task of exploring further frontiers and undertaking only those aspects which require skills or facilities not available with others

and of training other specialists. Only through such an approach can we spread the knowledge of plastic surgery and help it reach the masses.

A large burn is one of the major traumas that a body can sustain. Despite the establishment of several expensive air-conditioned burns units in our country the mortality rate has remained static at a high level over the years. Many of the burns that came to our unit in Bombay were from a District Hospital. They came several weeks late with heavy infection and severe contractures. My colleague Dr. Swaran Arora took the task of fly-proofing a room in the District Hospital, installing a shower in the bathroom and training the local staff in care during the shock phase using a simple chart and the patients own body responses like restlessness, thirst and urine output for monitoring oral and intravenous therapy. The relatives were taught to nurse and feed the patient, who bathed himself with soap and water as often as he wished. Dr. Arora went once a week to undertake skin grafting, minor grafting could also be done by the nurse. The result of treating burns under these conditions at the District level showed mortality results equivalent to any other burns unit in the country including our own. Frequent bathing reduced the superinfection which leads to toxæmia and dramatically reduced skin grafting because of preservation of the surviving epithelial elements. It also markedly reduced contractures of the hands and feet even in the absence of physiotherapy.

The treatment of facial and head injuries including fractures can be adequately treated in the absence of x-rays and CT scans if we examine the patient carefully, using our

hands and 'x-ray eyes' as was taught by Gillies. The only specialized equipment required for treating these injuries is stainless steel wire and a carpenters burr.

The majority of hand injuries involve the finger tip. If these are cleaned thoroughly with soap and boiled water and a small Thiersch or Reverdin graft is applied, It has been demonstrated by Koch and Allen as early as in the thirties that the vast majority would not require further surgery. Yet we continue to see hands frozen in the extended position because the treatment consisted of antibiotics and a wooden board for a splint. Dr. B. B. Joshi of Bombay has shown how functional splints can be devised by the surgeon himself using simple tools and materials obtained from any hardware shop.

The making of external facial prosthesis is considered a skilled job ; however, we have succeeded in training a semi-literate ward-boy who makes ears, fingers and orbital prosthesis as well as routine and custom made silastic implants which we have used successfully over the years.

The reversed dermal flap devised by Dr. Ravindra Thatte is, I believe, a quantum jump in the progress of plastic surgery, comparable to myocutaneous flaps and microsurgical transfer of tissue because of its simplicity and hence wide applicability. Dr. Doddi of Poona, has also demonstrated that microsurgery of medium sized vessels can be done without magnification, or if you prefer with the side of a simple corneal loupe, thus demystifying this subject and expanding its applicability to a degree hitherto not imagined.

These are only a few examples of simplifying the complicated. Time precludes the detailing of similar experience in many other aspects of our speciality.

The vast majority of plastic surgery can be performed most adequately in a basic general surgery theatre with the addition of about fifteen fine instruments and a skin grafting knife; a traumatic sutures, disposable syringes, central sterilization and cardiac monitors have added little to the quality of results but have greatly increased costs.

Anaesthesia provides an excellent example of the disadvantages of unnecessary sophistication under the conditions prevailing not only in community but also in city hospitals. The Boyle's apparatus has almost replaced other methods of anaesthesia with the result that cancellation of operations is a common occurrence due to non-availability of anaesthetic gases. Yet McIntosh has demonstrated that the EMO (Oxford Vaporizer) can serve the requirements for most surgery using ether and air.

Let us now take a few examples of plastic surgery and see how they are treated in the existing system as against the proposed model.

A villager's hand is severely crushed in a sugarcane press. By the time he arrives there is onset of severe infection and possibly the danger of tetanus or gas gangrene. The only bed is a mattress in an overcrowded ward with further risk of cross infection. The treatment is prolonged and consists of local and system antibiotics therapy. The frozen hand is later referred to a plastic surgery unit

for reconstruction, entailing multistaged surgery with a far from functional result. The children suffer from malnutrition because there is no earning member at home. No wonder the patient often returns home before completion of treatment.

On the other hand, in the proposed model, the village health worker will take the patient to the local subcentre where the wound will be washed with soap and boiled water. The villager would already have been routinely immunised against tetanus. After giving a clean dressing and a sling to elevate the limb the individual will be transported within an hour or two to the local community hospital where the wound will be debrided under anaesthesia, covered with a skin graft and immobilized in a functional position. His wife can live at home to continue her work and look after her children and also be able to visit the patient each day.

About 21,000 children are born each year in India with clefts of the lip and palate. At a conservative estimate of two operations per child, this would amount to about 50,000 operations per annum. There is no possible way in which the existing plastic surgery units can meet this load. Unfortunately, the present day general surgeon unlike his predecessor does not have an opportunity to learn to deal even with the simple clefts of the lip during his training. The majority of the deformities hence remain uncorrected while a few come to the city for a single operation on the lip. There is hardly any follow-up.

In a decentralized set up the mother and relatives would be consoled by the village health worker that this is a normal occurrence

and she would teach the mother how to feed the baby and take its weight. She would also take the mother to the Community Hospital at the appointed date when the plastic surgeon from the District Hospital comes on his monthly visit. The child will be examined jointly by the plastic and general surgeons and the decision made whether it can be operated at the Community Hospital, if it is a simple cleft of the lip, or given an appointment for surgery at the District Hospital. The follow-up would also be conveniently at the local hospital. Even the poorest villager would wish to avail of such a personalized service which is literally at his doorstep. Instead of 21,000 problems it would mean 50 operations per year divided between one plastic and ten general surgeons, a very manageable load.

Leprosy affects about 12 million persons in the tropical countries. Due to delay in detection and irregularity of treatment almost 10% have deformities that need some form of reconstructive surgery. At about three operations per patient this disease alone could absorb the full attention of all the plastic surgeons in the developing countries. Because of the fear and stigma even among the medical profession there is not only a dearth of centres undertaking surgery for these patients but the programmes for control of this disease are also poorly implemented. The answer to this problem is not surgery but prevention of deformities through early detection and ensuring regular treatment. Our experience in a rural health project demonstrates that the village health worker can not only be the most effective agent for

early detection and ensuring regular treatment but can also help to overcome the stigma and hence the need for rehabilitation. This is because detection and treatment is relatively easy but the approach to the patient requires a high level of cultural identity which only another villager can best achieve.

How would Gillies have looked upon such a model? I believe he would have endorsed it for much of the thought and practices suggested in this model are entirely in keeping with his philosophy. He was a man who thrived on difficulties, in each of which he saw a challenge. He developed a highly effective referral system to treat the innumerable gunshot injuries of the face he saw in the battle fields of France in the First World War. Instead of being overwhelmed by the problem and its magnitude he set about organising the flow of casualties from the battle front to the field stations and base hospitals and from these to the apex centre at Sidcup. He did not wait for official permission but printed labels with the address of the Queen Mary Hospital at Sidcup and distributed them to all the medical officers in the field with instructions to tie them on the wrist of the patient. An unbelievable 11,000 facial injuries were treated by an enthused team whose only motto was to get on with the job. The results which were published in the classic 'Surgery of the Face' in 1920 demonstrates how much could be achieved under conditions which were no better than what exists today in the rural hospitals of the developing world. There were no antibiotics and the facilities for anaesthesia and blood transfusion were primitive. To Gillies it was only the surgeon

behind the knife that mattered : His aversion to bureaucratic methods was well-known.

In my opinion Gillies' greatest contribution to plastic surgery was the evolving and teaching of the principles on which our speciality is based. Just as diagnosis of the disease is the basis of medicine so is tissue diagnosis to plastic surgery. Some of you may remember the Thursday afternoon clinics at Rook-down House in that little room overlooking the garden where he taught these principles before an audience which invariably consisted of surgeons from many countries. The next step was the meticulous planning of the reconstruction. The only tools he used were his keen powers of observation, a measure tape, a piece of jaconet and a pair of scissors.

Many will wonder as to how he could get such excellent surgical results without the modern aids which we take for granted. The secret lay in his other principle which Patrick Clarkson aptly summed up as 'tissue craft'. Gillies knew that nature, with its remarkable powers of defence and healing can be relied upon to cope with most infections provided it does not have to cope with an excess of dead or bruised tissue, spaces filled with haematoma or large raw areas. His success was the result of meticulous planning and equally meticulous surgery.

Many of the inadequate results of plastic surgery even today are the result of failure to observe the principles laid down by this great master.