

Neurosurgery in Papua New Guinea

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The war torn or famine stricken under developed countries such as Somalia, Ethiopia and Rwanda clearly have very basic health care needs. Primary and preventive strategies should be the priority. However, in politically stable developing countries such as Papua New Guinea where food supplies are available and primary health care services and infrastructure are developed, there is a need for adequately resourced and staffed secondary and tertiary health care facilities. The World Bank report emphasises primary and preventive health care to the exclusion of specialist services.¹ It is a fallacy to argue that these services are unaffordable luxuries. Many lives can be saved and much crippling morbidity prevented by the provision of surgical services. This no less applies to neurosurgery. Unfortunately, this is not the intention or priority of many of the governments of the developing world, the World Bank or the World Health Organization.

Papua New Guinea (PNG) is a developing country of 4 000 000 people to which Australia contributes significant aid. The medical and surgical diseases encountered are similar in type and distribution to other developing countries in the tropics.² However, as the Western lifestyle is adopted, standards of living improve, rapid urban development ensues and life expectancy increases, the incidence of cancer,^{3,4} diabetes,⁵ hypertension,⁶ cardiovascular and cerebrovascular disease,⁷ urban violence and road trauma,⁸ will increase significantly, and with these trends the need for neurosurgical services will become overwhelming. There is no neurosurgeon or computerised tomographic scanner (CT) in PNG. This is clearly an unacceptable situation, when it is recognised that the ratio of neurosurgeons per head of population is one or more per 200 000 in many developed countries.

What needs to be done—by whom?

The common neurosurgical problems encountered in PNG are trauma to the head and spine, infections of the

CNS, particularly tuberculosis (TB) and cryptococcosis, cerebral mass lesions, and congenital problems such as hydrocephalus, sincipital encephalocele, spinal dysraphism and tethered cord.

Over 2 two-week periods in 1992 and 1993, a visiting neurosurgeon (JVR) encountered 82 neurosurgical patients. 55 (67.1%) were consultations, 23 (28%) had elective surgery, 4 (4.8%) had emergency surgery and 16 (19.5%) cases were awaiting surgery. The cases consisted of 9 major groupings: neurotrauma 18 (7 severe), spine 18, congenital 13, hydrocephalus 4, scalp, skull, orbit 6, vascular 2, peripheral nerve 3, and neurology 5. Thus, there is plenty of potential work for a neurosurgeon in PNG.

The general surgeons are able to cope with many acute neurosurgical problems provided they have received at least some relevant training and experience which is provided in the four year general surgical training programme (MMed). The management of raised intracranial pressure is difficult without the benefit of CT, but it is still possible to adequately diagnose and treat these patients in PNG and other developing countries.⁹ At present, clinical localisation of cerebral mass lesions supplemented with ventriculography, encephalography or cerebral angiography performed with cut films and a manual changer must suffice. However, these investigations are not usually performed because of the general unavailability of craniotomy.

The successful management of head injury by general surgeons has recently been reported from Malaysia¹⁰ and in Central Africa.¹¹ The isolated general surgeon may repair selected ethmoidal encephaloceles transfacially and avoid craniotomy.¹² The general surgeon may also be technically competent to correct extradural spinal cord compression, spinal TB, hydrocephalus, myelomeningocele, or drain an intracranial epidural abscess secondary to sinus infection, but will require extensive experience and judgement to comprehensively manage these more challenging problems.

The general surgeon will generally be unable to handle frontonasal encephalocele via craniotomy, persistent CSF rhinorrhoea, intracerebral trauma secondary to penetrating or missile injury, intracranial tumour or other mass lesions, posterior fossa surgery, subarachnoid haemorrhage or spinal disorders such as ruptured intervertebral disc, intradural tumour or lipomyelomeningocele. It is a tragedy that many patients with the problems listed in these two categories remain untreated or inadequately treated.

How can the needs be met?

There is a basic craniotomy and spinal set of instruments at the Port Moresby General Hospital and in major provincial centres, but there are no neurosurgical microscopes, microinstruments, head holder, stereotactic frame or Cavitron. Prostheses such as shunt products are in very short supply, or unavailable. Can neurosurgery be practised under these sub-optimal circumstances? Many of the basic neurosurgical procedures mentioned above can be performed without the sophistication of the modern neurosurgical operating room. High care nursing wards are available in many of the larger hospitals which could manage postoperative neurosurgery cases. Intensive care with ventilation and invasive monitoring is only available in Port Moresby, and this is limited by a lack of specially trained nurses and inadequate equipment.

The appointment of a consultant neurosurgeon would necessitate the acquisition of a CT scanner. Myelography is available in Port Moresby and enables adequate investigation of spinal disorders. Ultrasonography is performed by paediatricians in Port Moresby and enables diagnosis of hydrocephalus in infants. These investigations are not generally available outside the capital. Adequate training of radiologists, radiographers and technicians to service the machine are essential prerequisites for the installation of CT. Magnetic Resonance Imaging (MRI) is of secondary importance to the developing world because of the much greater cost and expertise required to run the machinery and interpret the images.

The donation of unused or surplus equipment such as surgical instruments, shunt products, suture materials, textbooks and neurosurgical journals are all gratefully received in the developing countries. Medisend is an organisation based in the United States which is already fulfilling this role in some developing countries. Perhaps the Neurosurgical Society of Australasia could coordinate a similar service with other countries in South East Asia to help those regions in need.

The medical faculty of the University of PNG currently graduates 15-30 doctors a year. PNG is well on the way to being self-sufficient in general medical and surgical care. Specialist surgical training programs are being developed which will lead to self-sufficiency in orthopaedics, urology, ENT, ophthalmology and head and neck surgery. These trainees are benefiting from the visits of surgical specialists, and also from periods of training in Australia. The balance of home versus foreign training is a difficult one. Exposure

to high technology care may seed discontent and frustration on return, but specialist training offered to a few carefully chosen graduates is necessary, particularly if those specialties are in an early stage of development.¹³ The first trainees must also receive some training at home so that they learn to recognise the indigenous pathology and are taught how to manage it in their own environment.

The Australian International Development Assistance Bureau (AIDAB), through the Medical Officers Training Programme (MOTP), is contributing effectively to ensure the continued success of these programs. AIDAB has sponsored the visit of an Australian Neurosurgeon (JVR) for 2 weeks per year for the last 3 years, and two PNG surgeons have received six months of neurosurgical training in Australia with AIDAB support. However, no general surgeon has yet embarked on a full neurosurgical training.

The role of the visiting neurosurgeon is to demonstrate to the PNG doctors what can be achieved with limited equipment and resources; to instruct on neurosurgical techniques and procedures; to teach medical students and postgraduate students the diagnosis, pathology and management of diseases of the nervous system; to promote preventive strategies in neurotrauma, such as wearing of helmets by cyclists and of seatbelts by vehicle occupants; to aid the administration in forward planning and provision of neurosurgical services and equipment and in doing so, lobby for change; and finally, to act as an ambassador for Australian neurosurgery. The visiting neurosurgeon must approach his task with great sensitivity to the culture, language and mores of the hosts. Durham-Smith has recently suggested guidelines for surgical colleges in planning an assistance program to a developing country.¹⁴ These include behaving diplomatically, delivering aid by invitation only, having achievable aims which satisfy the recipient, and assisting the host country to introduce technical advances. All are applicable to the development of neurosurgery in PNG and other developing countries of the region.

The goal of neurosurgical aid to PNG should be to train two neurosurgeons so that the foundation will be laid for PNG to be able to manage its own neurosurgical problems by the year 2000. Similar plans have been made for cardiothoracic and paediatric surgery. This also applies to the other surgical specialties. Once there are indigenous neurosurgeons, there will be much more pressure generated internally to improve the infrastructure and resources for neurosurgical and other specialist surgical care throughout PNG. As the general public become more aware of advances in neurosurgery and what can be achieved, the current nihilistic attitudes will wane, and further external impetus for development of neurosurgical services will ensue. Neurosurgeons in Australia and other developed countries of the Pacific rim should give far more individual and collective thought and energy to the development and support of neurosurgical services in the developing countries of our region.

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