

# Whither Paediatric Surgery?

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I have been asked to say a few words about the future of paediatric surgery. In other words, whither paediatric surgery? Where are we going? My first reaction is to say 'the sky is the limit', because in the past 3 decades there have been greater advances in the surgery of infancy and childhood than in any other branch of surgery. The mortality of common conditions such as acute appendicitis, osteomyelitis, intussusception and pyloric stenosis has been reduced from about 10% to virtually zero. There have been greatly improved results in the treatment of malignant disease in childhood and there are the phenomenal advances in the surgical care of the newborn and in the treatment of life-threatening congenital malformations — so much so that a mortality rate of 90% has been converted to a survival rate of 90%. No less impressive have been the advances in the special branches of children's surgery, for instance, the highly successful treatment of hydrocephalus by the neurosurgeons, the sophisticated treatment of urological disorders and the tremendous progress in paediatric cardiac surgery. All this has happened so rapidly that paediatric surgeons themselves are somewhat staggered. Indeed, there is even cause for alarm because we might wonder whether paediatric surgery can continue its brilliant career, or will it disappear as suddenly as it came, like a 'seven-day wonder'?

To me the answer is simple, because there is no doubt in my mind that as a speciality paediatric surgery has come to stay. Firstly, the superior results obtained by paediatric surgeons have proved that the scope is large enough and also complex enough to require special training and special skills. Secondly, the problems remaining to be solved are sufficiently important to justify the full devotion of surgeons to paediatric surgery, and sufficiently involved to demand such devotion. Let us look at these problems and speculate on their solution.

Firstly, there is trauma — killer number one in young children. The Arabs have helped us solve part of this problem because petrol restrictions have

brought about speed limits, and speed limits have more than halved the carnage on our roads due to motor vehicle accidents. On the other hand, burns continue to constitute a major paediatric problem, and what is needed for the future is the establishment of special burn hospitals dedicated to the care, without cost, of children with burns, and to research into better ways of treating them.

Secondly, there is killer number two — cancer. Recently, developments have greatly improved the outlook of children suffering from malignant disease. Surgery has played only a secondary role in these advances, and we owe a great deal to contemporary progress in chemotherapy and radiotherapy. Nevertheless, surgery will continue to play its part and the paediatric surgeon of the future will achieve his results, as we do today, by being an essential member of a team of oncologists.

Thirdly, there are the conditions which have become the special prerogative of the paediatric surgeon, namely congenital abnormalities with particular reference to life-threatening malformations in the newborn. Despite the tremendous advances in this field there are still many problems to be solved.

In regard to surgery in the newborn, it is unlikely that technical skills and finesse will achieve much improvement in results. However, by means of microsurgical techniques, complicated anomalies which cannot be corrected today, may tomorrow become amenable to surgical expertise. On the other hand, some abnormalities will remain technically inoperable, and here I refer in particular to renal dysgenesis, multiple intestinal atresias, the short-bowel syndrome, severe cardiac anomalies and biliary atresia. Much will depend on progress in organ transplantation, but judging by recent trends, the future augurs well, and paediatric surgeons of the future will no doubt play an important role in exploiting this field.

The restoration of organs in the newborn, however, should not be the ultimate goal, and the future paediatric surgeon must turn his attention to



the unborn fetus. Neonatology has been established as a special discipline and now fetology has to follow. In animals the initial problems of fetal surgery have been solved, and almost every organ has been successfully operated on in a variety of species. In the human fetus the first hurdle, namely antenatal diagnosis, has almost been overcome. It is now possible to diagnose external abnormalities such as anencephaly, spina bifida, omphalocele and orthopaedic deformities by means of fetography, and particularly by fetoscopy, which has become a practical proposition. Moreover, by means of amniography intestinal anomalies can be detected in the fetus, and with the combined procedure of amniography it is possible to diagnose oesophageal and intestinal obstructions as early as at 22 weeks. Indeed, the fetologists have gone further and exteriorised the limbs of human fetuses for the purpose of intravenous infusions, so why not inject contrast material into an arm or leg vein or artery of the fetus to obtain, for instance, an intravenous pyelogram or cholangiogram or even an arteriogram?

In regard to therapy, the human fetus has been successfully transfused transperitoneally and indeed intravenously. Furthermore, modern drugs and hormones have rendered it possible to prevent premature labour, and so the possibility of surgical correction of deformities in the human fetus need no longer be a fantasy. This is an exciting thought because the maternal uterus is surely the best in-

tensive care unit that can be devised, and if we can correct anomalies before birth our success must be so much greater.

But we can go even further and start thinking of molecular surgery. By means of amniocentesis our scientists can now diagnose chromosomal and genetic abnormalities even before the 20th week. The paediatric surgeon should, therefore, not stop at neonatal nor even fetal anomalies, but maybe start tampering with the embryo — removing a gene here and implanting another there, or even manipulating the ribosomes and RNA, forever striving to improve the quality of life, because it is our purpose and our privilege to restore and help our fellow men; and when these fellow men are little children, we are indeed fortunate, because, to quote Willis Potts: 'The satisfaction of correcting a deformity in a newborn infant lies in the fact that all his life lies before him. Parents hope for miracles, but are grateful for the best that can be given by a mere human being'. In this atomic age where man has stepped on the moon, miracles are surely possible. So why should we not realise the hopes of the anxious parents and let our 'best' work miracles for their infants who have 'no language but a cry'?

\*Address delivered in Tokyo on 25 June 1974 as guest at the 11th Annual Meeting of the Japanese Paediatric Surgical Society (abridged).

#### REFERENCE

1. Potts, W. (1969): *The Surgeon and the Child*. Philadelphia: W. B. Saunders.