THIEME FLEXIBOOKS

Synopsis of Pediatric Surgery

by P. P. Rickham, R. T. Soper
and U. G. Stauffer

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with contributions by
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Foreword

Pediatric Surgery is the youngest branch of General Surgery, having enjoyed rapid development only since World War II. Although at least half of all children admitted to hospital suffer from surgical conditions and although one-fourth of all operations are performed on children, there does not exist a textbook for students on this subject either in the German-speaking countries or in North America. Students are therefore forced to learn what they can about surgical conditions in childhood by reading general textbooks of Surgery or Pediatrics, which often deal with this subject inadequately, or to read the large specialist volumes which are far too advanced for their needs.

In trying to write a short, illustrated student's textbook on Pediatric Surgery simultaneously in English and German, we believe we may fill a void which has become apparent to us when giving lectures, tutorials and bedside teaching to undergraduates. Much of Pediatric Surgery is still in the developmental phase and views on the etiology, pathology, clinical history and treatment differ widely. In a book of this kind long discussions of the various theories seem out of place and we have tended to be dogmatic in order to be concise. For the sake of brevity we have also omitted all those important surgical and pediatric considerations which the student can learn by reading the appropriate textbooks on this subject. For the same reason we have also tended to omit some of the rare conditions one meets in pediatric surgical practice and have concentrated on the clinical aspects of the more common diseases. This is not a book for surgeons, and the technique of the various operations is only described in the barest outlines.

Although this book is mainly directed toward medical undergraduates, we hope that it may be of some use also to those in General Practice and even to the busy Pediatrician who finds it time-consuming to read through the large pediatric surgical textbooks and literature. Pediatric Nurses and certain paramedical personnel might also benefit from the book.

The fact that the co-authors were or are still working together with me has, we hope, ensured that although this is a book written by a number of authors, there is a certain uniformity of doctrine.

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P. P. R.

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1 Pediatric Surgery and the Child in Hospital

P. P. RICKHAM

Why do we practice pediatric surgery and why should students learn pediatric surgery as a distinct surgical discipline? Is it a branch of general surgery or is it just the miniaturized surgery of adults? Pediatric surgery has rightly been termed "the whole of surgery applied to a special age group". For essentially the same reasons which justify separation of children with medical problems (Pediatrics) from their adult counterparts, we feel that children with surgical disease require special consideration because of the profound physical and psychological differences which are age-related. The best results in the surgery of childhood are clearly obtained by teams of doctors and nurses specialized in the management of children, preferably working in institutions designed for this purpose. Every medical student should be aware of the fundamental physical and psychological differences in the surgical management of children and adults.

Physical Differences

1. Cell division in the adult occurs largely to repair the wear and tear of the body and also of course for reproductive purposes. In contrast, cell division is greatly increased in children to allow for growth. This is especially noticeable during the first four weeks of life (neonatal period) and to a lesser extent during puberty.

2. This increased rate of cell division explains the tremendous healing power of the infant compared with that of adults, especially the very elderly. It also explains the child's great resistance to physical trauma and the rapidity with which normal body functions are reestablished following a traumatic insult. In general, the younger the child, the more rapid his growth and the greater his resistance to physical trauma. On the other hand, the more active the rate of cell division, the lower is the resistance to roentgen radiation and cytotoxic drugs; neonates are very prone to injury from these agents.

3. Surgery in neonates is further complicated by the fact that the organism after birth is in a transitional state between the parasitic existence in utero (where the infant is maternally dependent not only for his nutrition, oxygenation, etc., but where his body functions are also largely influenced by maternal hormones) and an independent existence after birth. During this transition period the infant's metabolism changes markedly as his own hormones take over the steering of body functions. In addition, some of the newborn infant's organs do not function quite as well as they do later in life; often maximal

efficiency is not achieved until several days, weeks and even months have passed.

4. Another important factor markedly affecting the surgery of childhood is the difference in the defenses against infections in children compared with that of older age groups. In the neonate the defense against infection only builds up slowly. At first he has little resistance apart from the passive immunity derived from the mother via the placenta. Active defenses against infection gradually develop, provoking in older children a violent reaction to infection often accompanied by more complications than we observe in adults. The lymphatic system is the main source of the body's anti-infection activities, and in children this system is extremely well developed.

5. Today adults admitted for surgery suffer mainly from four groups of conditions: Malignant tumors, functional diseases such as cholecystitis and peptic ulcers, degenerative processes and trauma. In children the most important conditions necessitating surgery are congenital malformations, which may be so severe that unless they are immediately corrected will kill the newborn within a few days. Other malformations may be relatively trivial in nature and can be corrected later on in life. Trauma is also frequently encountered in childhood, but the types of trauma and their management differ markedly from those of adult life. Malignant tumors are less common but paradoxically rank second to trauma as a cause of death in children in developed countries. Adult malignancies most commonly arise from epithelial tissue. In contrast, malignancies in children arise mainly from embryonic tissue and are extremely malignant. Fortunately some of these tumors are very sensitive to cytostatic drugs and the prognosis, which until recently was virtually hopeless, has now become quite favorable in certain cases. As previously stated, children frequently contract infections and often react to these infections much more violently than do adults. Surgical infections such as appendicitis, osteomyelitis, etc. are not only common in childhood but their management differs widely from the same disorders occurring in the older age groups.

Psychological Differences

1. Doctor/Patient Relationship

In the surgical treatment of adults there are usually only two people involved, the surgeon and his patient; it is vital to have satisfactory contact between these two. In the very young, personal communication between surgeon and patient is virtually impossible and a clinical history or even a description of his symptoms are often