Editorial

NEWER HORIZONS IN PEDIATRIC ORTHOPEDICS

Orthopedics originated in the correction of deformities of children and this makes Pediatric Orthopedics its oldest sub-speciality. However, in a sense, Pediatric Orthopedics is the youngest offshoot of Orthopedics as more and more Orthopedic Surgeons realise the immense challenges that this field poses and the many new developments that are constantly taking place. The spectrum of disorders that we see today is not very different from that seen in the 18th century when "Orthopedics" started. However, there are new solutions to old problems and the focus of attention has shifted to problems heretofore considered unsolvable. Newer horizons are visible.

Reconstruction of the Extremities

Utilizing modern techniques of limb lengthening, length defects of large magnitude can be restored to normalcy. We commonly encounter shortening of a limb due to a number of causes, *e.g.,* post traumatic malunions, growth plate disorders, post infective joint dislocation, following poliomyelitis, generalized bone disorders or of congenital etiology. Recent advances in this field have focused around securing the best possible fixation of bone and obtaining the maximum bone regeneration in the distracted gap. The Ilizarov fixator(1) which is a circular fixator, provides the best possible stability as it grips the extremity all over the circumference. With a stable fixation new bone formation improves and now it is virtually never necessary to bone graft the distracted gap. Ilizarov has also given us laws of tissue regeneration(2,3) and these if followed ensure good regeneration of bone. Tension (distraction) stress when applied across healthy tissue stimulates regeneration of all distracted tissues like bone, muscles, vessels, nerves and skin. This is called distraction histogenesis. Optimum rates and rhythm of distraction have been established and these if followed ensure a high quality regenerate. Thus length can be restored by bone and soft tissue distraction. Bone can be transported in any desired direction and can be shaped in any fashion required–amputation stumps can be elongated, non unions can be healed and deformities corrected using this technique–potentially, any reconstruction can be carried out(1).

The availability of these techniques have revolutionised the field of reconstructive surgery and has application to many conditions encountered in pediatirc orthopedic practice(1,4-6). Congenitally short bones anywhere can be elongated, bone tumors can be resected and reconstructed, osteomyelitic bone can be excised and the gap filled in, angular deformities can be corrected. Non unions and congenital pseudarthrosis can be healed. Joint contractures can be stretched out. Resistant club feet can be corrected. For the first time we can offer elogation of stature which would be welcome for our dwarfed patients(7-10).

Mending Soft Bones

It is well known that in osteogenesis imperfecta, the bones are soft and fragile, break with minor trauma and deform very easily to produce grotesque deformities. Such children are usually doomed to repeat hospitalization for their fractures and most of them spend a considerable part of their childhood in and out of hospitals being unable to walk. For these patients and for others with similar bone problems like in rickets and osteomalacia, fibrous dysplasia, *etc*., internal strengthening of the bones can be carried out using nails(11,12). However with growth the nails apparently shorten and the bone below it is then liable to fracture and deformity(13). A solution proposed for this problem is that of a telescoping nail which can expand with growth and provide continued support to the bone(14-18). We have after a lot of effort been able to get these made locally and cheaply and that's good news for these patients.

The Cinderella of Pediatric Orthopedics–Spinal Deformities

Spinal deformities are still veiled in a lot of ignorance. Pediatricians and Orthopedic Surgeons alike seem to harbour the idea that nothing can be done for this problem till the child becomes skeletally mature. Nothing could be farther from the truth. By the time the child matures it is too late–the deformity has reached incorrectible proportions and the only benefit derived from surgery would be to halt further progression. Cosmesis and function would still be a problem.

Any progressive spinal deformity needs to be fused and further progression halted regardless of the patients age(19). Instrumentation where feasible improves the correction and provides stability so that the fusion can proceed in peace.

In the congenital group a thorough evaluation needs to be made for other cogenital problems affecting the renal, tracheo-oesophageal and cardiac areas as also for instraspinal anomalies like a septum of diastematomyelia(19). This has relevance to treatment. If the spine is distracted in the presence of cord tethering paraplegia may ensue. Today it is possible to resect hemivertebrae which produce a marked angular deformity to correct decompensation of the spine.

In paralytic scoliosis, *e.g.,* in poliomyelitis and muscular dystrophies, internal fixation acts as a splint allowing balanced unsupported sitting(20). This frees the hands for more productive work. Internal splinting can be carried out at an early age and this may help direct further growth in a straight line rather than in a deformed way.

A variety of implants can be used for internal fixation of the spine(21). The best known is the Harrington rod(22). More recent innovations are the Luque sublaminar wire technique(23) and the Zielke vertebral body fixation(24) using screws and a cable which we have innovated here. The CD system (Cotrel DuBousset system)(25) is still under evaluation, but provides good rigidity of fixation and correction.

Kyphotic deformities of the spine in children are most commonly due to tuberculosis and with growth these are bound to increase. They need to be tackled early in life to permit more balanced growth and to prevent late paraplegia due to the deformity.

Pediatric-Orthopedic Interaction

"Surgery is destined to the practice of Medicine" and I may paraphrase "Pediatric Orthopedic Surgery is destined to the practice of Pediatrics". As the standards of pediatric care improve certain surgical problems may be eliminated, *e.g.,* those due to rickets, tuberculosis, poliomyelitis and the like. Other disorders can be diagnosed and managed earlier, *e.g.,* congenital abnormalities, especially with help of screening programs. Yet other disorders like cerebral palsy and spinal dysraphism, myopathies, metabolic and endocrine problems, arthritis, hematological problems, bone dysplasias, *etc*. would do better with a combined approach and these are the fields where we require better interaction. With such an interaction, I am sure new horizons will be visible.

Ashok N. Johari,
Children's Orthopedic Centre,
7, Jilani Manzil, 1st Floor,
Opp. Portuguese Church,
Gokhale Road (North),
Dadar (W), Bombay 400 028.

REFERENCES

1. Ilizarov GA. Clinical application of the tension-stress effect for limb lengthening. Clin Orthop 1990 250: 8-26.
2. Ilizarov GA. The tension-stress-effect on the genesis and growth of tissues. Part I. The influence of stability of fixation and soft tissue preservation. Clin Orthop 1989, 238: 249-281.
3. Ilizarov GA. The tension-stress effect on the genesis and growth of tissues. Part II. The influence of the rate and frequency of distraction. Clin Orthop 1989, 239: 263-285.
4. Grill F. Correction of complicated extremity deformities by external fixation. Clin Orthop 1989, 241: 166-176.
5. Grill F, Franke J. The use of the Ilizarov distractor for the correction of relapsed or neglected club foot. J Bone Joint Surg 1987, 69B: 593-597.
6. Street RJ, Saleh M. Limb lengthening in 1990—A review. Clin Orthop India 1991, 6: 133-151.
7. Saleh M, Burton M. Leg lengthening: Patient selection and management in achondroplasia. Orthop Clin North Am 1991, 22: 589-599.
8. Price CT. Limb lengthening for achondroplasia: Early experience. J Pediatr Orthop 1989, 9: 512-515.
9. Vilarrubias JM, Ginebreda L, Jimeno E. Lengthening of the lower limbs and correction of lumbar hyperlordosis in achondroplasia. Clin Orthop 1990, 250: 143-149.
10. Aldegheri R, Trivel G, Renzi-Brivio L, Tessari G, Agostini S, Lavini F. Lengthening of the lower limbs in achondroplastic patients. A comparative study of four techniques. J Bone Joint Surg 1988, 70B: 69-73.
11. Sofield HA, Millar EA. Fragmentation, realignment and intramedullary rod fixation of deformities of the long bones in children. A ten-year appraisal. J Bone Joint Surg 1959, 41A: 1371-1391.
12. Albright JA. Management overview of osteogenesis imperfecta. Clin Orthop 1981, 159: 80-87.
13. Marafioti RL, Westin GW. Elongating intramedullary rods in the treatment of osteogenesis imperfecta. J Bone Joint Surg 1977, 59A: 467-472.
14. Bailey RW, Dubow HI. Studies of longitudinal bone growth resulting in an extensible nail. Surg Forum 1963, 14: 455-458.
15. Bailey RW, Rodriguez RP, Dubow HI. Clinical experience with the use of an intramedullary device that elongates with bone growth in children with brittle bones. J Bone Joint Surg 1976, 58A: 725.
16. Bailey RW, Dubow HI. Evolution of the concept of an extensible nail accommodating to normal longitudinal bone growth: Clinical considerations and implications. Clin Orthop 1981, 159: 157-170.
17. Bailey RW. Further clinical experience with the extensible nail. Clin Orthop 1981, 159: 171-176.
18. Lang-Stevenson AL, Sharrard WJW. Intramedullary rodding with Bailey-Dubow extensible rods in osteogenesis imperfecta. An interim report of results and complications. J Bone Joint Surg 1984, 66B: 227-232.
19. Winter RB. Congenital scoliosis. Orthop Clin North Am 1988, 19: 395-408.

20. Luque ER. Paralytic scoliosis in growing children. Clin Orthop 1982, 163: 202-210.
21. Drummond DS. A perspective on recent trends for scoliosis correction. Clin Orthop 1991, 264: 90-102.
22. Harrington PR. The history and development of Harrington instrumentation. Clin Orthop 1988, 227: 3-5.
23. Luque ER. The anatomical basis and development of segmental spinal instrumentation. Spine 1982, 7: 256-259.
24. Moe JH, Purcell GK, Bradford DS. Zielke instrumentation (VDS) for the correction of spinal curvature. Analysis of results in 66 patients. Clin Orthop 1983, 180: 133-153.
25. Cotrel Y, DuBousset J. Guillaumat M. New universal instrumentation in spinal surgery. Clin Orthop 1988, 227: 10-23.

NOTES AND NEWS

THIRD ASIAN CONFERENCE OF SEXOLOGY

The Third Asian Conference of Sexology, with a study tour to the ancient temples of India depicting erotica, has been organized by the Department of Sexual Medicine, Seth G.S. Medical College and KEM Hospital, Bombay under the auspices of the Asian Federation for Sexology from *November 27 to December 01, 1994* at the Taj Palace Intercontinental, New Delhi, India.

For further details, contact:

Dr. Prakash Kothari,
203-A, Sukhasagar,
Patkar Marg, Bombay 400 007, India.
Phones: 3612027/3619165
Fax: 9122-204-8488.