Orthopaedic management of cerebral palsy

Like so many other facets of orthopaedic surgery, the orthopaedic management of the child with cerebral palsy has changed significantly in the last 10 to 20 years. As in many other fields, the technology has advanced rapidly, particularly in the development of the sophisticated assessment of gait in the gait laboratory. As usual with such advances, we have a mass of new data that solves some problems and creates others. Gait laboratories are expensive, labour intensive, and time consuming. They are also limited to children who can walk with or without aids within the confines of the laboratory and can cooperate with those running it. They have added significantly to our knowledge but do not provide an easy answer to the often complex and multidisciplinary problems of the child with cerebral palsy. As a result, the orthopaedic surgeon will find himself working within a multidisciplinary team involving the neuropaediatrician, the physiotherapist, orthotist, and several other professionals involved with the care of these complex patients. At present there are few such laboratories in the UK but it is becoming increasingly difficult for an orthopaedic surgeon to provide satisfactory orthopaedic advice in the walking child without one. A simple well lit walkway with video recording equipment capable of individual frame analysis can provide satisfactory observational analysis of a child’s gait (M Pease et al, European Paediatric Orthopaedic Society, Oporto, April 1994).

In a most important article published in *Clinical Orthopaedics and Related Research*, Rang and Wright asked the question ‘What have 30 years of medical progress done for cerebral palsy’?1 This is a very thought provoking article and should be prescribed reading for all those involved in the management of cerebral palsy. Rang and Wright suggest that the success of medical treatment could be measured in terms of (i) reduction of the incidence and severity of cerebral palsy; (ii) reduction of the patient’s disabilities; (iii) reduction of the burden for the family and for society, both in human and in financial terms. Some progress has been made in all these areas but reviewing the patients attending my clinic from week to week, there is no cause for complacency and some justification for thinking in some ways we seem to be going backwards. Modern neonatal care has reduced the mortality of low birthweight premature infants but the incidence of brain damage leading to cerebral palsy in this group does not seem to have changed significantly.2

In my own practice, it is the severe end of the spectrum in cerebral palsy, namely, the child with severe spastic quadriplegia or, to use the term popularised by Professor Block, the total body involved child,3 that has increased most markedly. In the past orthopaedic management, both surgical and orthotic, was rarely considered appropriate for this group. In simple terms, the orthopaedic problems in children with cerebral palsy now break down to those in the ambulant group, for whom gait analysis is becoming more and more important, and the non-ambulant or largely non-ambulant group, in which quality of life as a non-ambulant person is the most important. Nowadays, in order to provide improved seating and mobility in this group, a stable straight spine and stable hips are considered a prerequisite.1 The incidence of spinal deformity in this group is high. Control of spinal deformity by bracing is difficult. Surgery is often extensive, time consuming, and without significant hazard. The natural history of hip displacement in this group suggests that over 50% will develop progressive displacement and dysplasia and up to 20% frank dislocation with time.4 Scrutton suggests that those children who do not pull to standing by the age of 3 years are at significant risk and radiographs should be taken of their hips once a year to monitor progressive displacement,5 which can occur early and be complete by the age of 5. Abduction splintage is widely used, although its precise role and value have not as yet been clearly evaluated. Early soft tissue surgery performed before displacement, measured by the Reimers migration percentage6 as greater than 50%, has been shown to be reasonably successful (K R Wood, J A Fixsen, British Society for Children’s Orthopaedic Surgery, 1989). Soft tissue surgery alone, once there is more than 50% displacement and/or significant acetabular dysplasia, is unlikely to be successful and requires major bony reconstruction of the hip, usually in the form of open reduction, femoral osteotomy, and acetabuloplasty. Like major spinal surgery, this is not without its hazards and is a significant ordeal for the patient and the parents. The alternative of

allowing the hips to progressively displace and ultimately dislocate is increasingly less acceptable as it would appear that a significant percentage of these hips will become painful. Also, the presence of a dislocated hip will impair the management of both seating and spinal deformity. The important message regarding orthopaedic management in this group is to involve the orthopaedic surgeon early in the management of the child, to monitor the hips and the spine closely from an early age and hope that early intervention, both orthotic and when necessary, surgical, can prevent the major hip and spine deformities that are seen so commonly at present.

Gait analysis has radically altered the orthopaedic surgeon’s attitude to the walking diplegic and hemiplegic. With regard to orthoses, particularly ankle foot orthoses, accurate analysis of gait, with and without the orthosis, can reveal much more clearly what it is or is not achieving. Imposing an orthosis that is of no benefit or even deleterious to the gait is just as bad as not making use of one which is beneficial. It is all too easy to fall into the trap of ‘doing something’ without any proof that what you are doing is truly beneficial. In the past, we were, I think, rightly cautious about surgery. Once done, surgery cannot be undone and the classic approach was to operate at one level only and see the effect before proceeding to further surgery. This became known as the ‘birthday operation’ syndrome. Gait analysis has given us the confidence and also the evidence that multilevel surgery is more beneficial and more effective. However, the time necessary for the analysis, the surgery, and the intensive follow up physiotherapy required impose very considerable stresses on the patient and the orthopaedic unit which takes on such surgery. It seems inevitable that this type of surgery will have to develop in specialised units, who have the time, the multidisciplinary expertise, and the financial support to provide it.

At the end of the day, particularly in a health care environment obsessed by audit and financial problems, we must face up to Rang and Wright’s three criteria of success. We must remember that orthopaedic management, surgical or non-surgical, is simply an attempt to adjust at the periphery for a primarily central neurological problem. It can never be curative. A realistic attitude from the patient, parents, therapist, physician, and surgeon is essential if orthopaedic management is to have any hope of success. The human and financial burden cannot be forgotten in a health service, which is finding it increasingly difficult, both in terms of manpower and finance, to satisfy the expectations of those it is trying to treat.

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