Use of movement analysis in understanding abnormalities of gait in cerebral palsy

Commentary
Gait laboratory analysis is a welcome attempt to introduce some science into a difficult and highly specialised area. Much orthopaedic energy has been directed to improve walking in children with spastic diplegia or hemiplegia. Even in the most experienced hands the results of surgery after careful clinical assessment are sometimes unpredictable and undesired.

Some reasons are not far to find. For example, intoeing is usually due to over activity of the medial hamstrings—and is corrected by lateral transfer of the semitendinosus. However, the psosas or other hip internal rotator may be responsible. The distinction can be made by analysis of the electromyogram during the walking cycle. Similarly analysis of the function of muscles which cross two joints such as the rectus femoris can assist operative decisions. Normally the rectus is active in early swing to help hip flexion as well as to prevent excessive knee flexion. If the rectus is active in stance also, and the problem is excessive hip flexion in standing, proximal release is logical. If, however, there is activity after early swing and the problem is excessive extension leading to a stiff gait distal release or transfer is a better option.

It is still an article of faith that better planned surgery will yield better results. This is entirely reasonable as, unlike dystonia, weak muscles in spastic disorders remain weak after surgery. Over active muscles remain strong.

Great caution must be exercised, therefore, in extending this analysis to children with extrapyramidal involvement. Comparison of results of procedures based on gait analysis with results of clinically based procedures will not be easy but will be necessary to convince sceptics, and this includes funding authorities.

As with all such surgery, the role of a physiotherapist throughout is crucial.

The picture of practice that has emerged in the United States where several gait laboratories have developed considerable experience is for recommendations to be made to the referring clinician. It is for those who know the child and family best to decide with them whether in this particular child in his particular social and educational setting, this particular procedure will be appropriate. Clinical judgments have not been replaced by gait analysis. Instead, I hope they will become directed to more logically relevant questions.
