

## Cerebral palsy : orthopedic aspects

Hüseyin YORGANCIGİL\*, M.D.

*Cerebral palsy is a disease that may show motion and posture disorders. Orthopedic management aims to correct these disorders and musculoskeletal deformities. Maximum ambulation of the patient and the functional use of the upper extremities is tried to be reached. Orthopedic surgery comes to the fore in the 4-6 years of age group. The range of motion of the joints is gained with operations on the tendons of the shortened and stretched muscles. These operations are called tenotomy, lengthening, recession or transfer of tendons. A neuroectomy operation is done on the nerve of a spastic muscle. In excessive deformities of bones and joints and in the older age group, osteotomy and arthrodesis operations are performed. Orthopedic surgery should be appreciated as a complementary part of the team-work for cerebral palsy management. [Journal of Turgut Özal Medical Center 2(1):107-108,1995]*

**Key Words :** Cerebral palsy, treatment, orthopedic surgery.

### **Serebral palsi : ortopedik yaklaşım**

*Serebral palsi hareket ve duruş bozuklukları ile seyreden bir hastalıktır. Ortopedik tedavi bu bozuklukları ve kas iskelet sistemi deformitelerini düzeltmeyi amaçlar. Böylece hastaların hareket yetenekleri geliştirilmeye çalışılır. Cerrahi tedavi, 4-6 yaş grubunda gündeme gelir. Kısalmış ve gergin adelelerin tendonları üzerinde yapılan ameliyatlara eklemlerde normal hareket genişliğine ulaşılır. Bu ameliyatlara tenotomi, tendon uzatması, geriye alınması veya transferi denir. Nörektomi ameliyatı spastik bir adelenin sinirine uygulanır. İleri deformitelerde ve daha büyük yaş grubunda osteotomi ve artrodez denen kemik ameliyatlari yapılır. Ortopedik cerrahi tedavi serebral palsi tedavisinde gerekli olan ekip çalışmasının önemli bir parçasını oluşturmaktadır. [Turgut Özal Tıp Merkezi Dergisi 2(1):107-108,1995]*

**Anahtar Kelimeler :** Serebral palsi, tedavi, ortopedik cerrahi.

Cerebral palsy is the result of a destruction to the developing brain and reveals as a disorder of motion and posture. While musculoskeletal system disability is the main problem in some children, mental retardation, convulsions, sensory, auditory, visual and speech disorders may present priorities in some others. The orthopedic surgeons try to help the patients in correcting their motion and posture disorders and musculoskeletal deformities. The aim is to provide the maximum ambulation of the patients, to enable them to use their upper extremities functionally and to make them gain the best possible performance of the daily activities<sup>1</sup>. During these efforts the orthopedic surgeons must be aware of their incompetence! Help is needed in mental, auditory, visual and speech problems that can affect the result of the orthopedic management. Pediatricians, neurologists, physiotherapists, psychologists, sociologists and audiology and speech therapists have to be able to intervene when needed. Management of

the patient as a whole, the team-work concept must always be borne in mind.

A goal must be set to start the treatment of the cerebral palsy. Only the desire to help is not enough. It should be a realistic goal. Successful treatment may be possible with the understanding of "trying for the possible, not failing in the quest for impossible". The goals may be short term or long term ones, for example getting the heels down and preventing the scissoring of the knees while walking is a short term goal. The long term goal is enabling the patient to be a community ambulator.

The orthopedic surgeon should see the cerebral palsied child as early as possible, and regularly. A case referred to an orthopedist when there is no other alternative, may be a neglected one for which little can be done. Therefore, the orthopedic surgeon should see the patient in the beginning and the management program must be carried on according to priorities put forward by his/her age and

\* : Süleyman Demirel University, Medical School, Department of Orthopedics and Traumatology - Isparta

deformities. In planning treatment, the status of the family and the psychosocial factors should also be taken into consideration.

Each age have its emphasis on treatment. In 0-3 years of age group, physiotherapy is the reasonable choice. The motor functions of the patient can be improved and the maximum capacity can be reached with physiotherapy. Sitting, standing and walking abilities are developed while contractures and bony deformities are prevented. The normal range of motion of the extremities is preserved. Physiotherapy is reported to be most helpful in the postoperative period with rehabilitation and education programs, preventing the preoperative deformities to reappear<sup>2</sup>.

In 4-6 years of age group, surgery comes to the fore. Postoperative cooperation which is vital to achieve maximum benefit from the surgery, begins in this age group. Mental retardation is not a contraindication for surgery but a patient's cooperation is very important in certain operations. The family's cooperation is also needed for surgical treatment. They should be ready for their own part of care and effort.

The child's school and education periods must be considered in planning surgery and related physiotherapy. For a child attending to school, it would be wise to time these procedures in summer vacations.

Talking to the family in every stage of the treatment is very important. It is necessary to avert unrealistic expectations. Everyone should know that cerebral palsy is a life-long disease. Even after an operation, the child will still have cerebral palsy. The motor capability of the child can be improved with operations, but it is impossible to bring him/her into a completely normal living pattern.

Surgical procedures employed in cerebral palsy<sup>3-5</sup> are summarized without technical details, in the following: Peripheral surgery is helpful, because spasticity causes bony deformity, capsular stretching, joint dislocation and, most important of all, inappropriate muscle length. Some muscles are too short, others are too long. With operations on tendons such as lengthening, recession and transfer the full range of passive movement is given with some tension remaining. With a neuroectomy operation the nerve causing spasticity of a muscle is found and excised. It is indicated in a non-ambulant patient and aims to release the muscle. Another soft tissue operation is capsulorrhaphy. This method is useful when a joint is unstable but the muscle imbalance must be corrected at the same time.

When the deformities of bone and joints are too large to correct with soft tissue operations, the osteotomy operations are performed. These operations are used for correction of the bony deformities and are somehow difficult technically. Metallic fixation materials are used in osteotomy operations. Arthrodesis is an operation that "freezes" the joint. This operation, preventing the whole motion of the joint is generally performed in the foot. Arthrodeses can also be performed in the hand and wrist with aesthetical considerations<sup>6</sup>. These operations on bones must be canceled until 10 years of age, not to disturb the normal growth pattern<sup>5</sup>.

After completion of the treatment program, schooling and psycho-social development of the child have to be achieved. This is another important part of cerebral palsy management program and gives the life-skills training to the patient. Such efforts will be complementary for the orthopedic surgeon's enthusiasm to gift the healthiest possible individual to the community.

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**Correspondence Address :** Hüseyin YORGANCIGİL, M.D.  
Süleyman Demirel University, Medical School,  
Department of Orthopedics and Traumatology  
Assistant professor,  
32040 İSPARTA  
Phone: 0 246 2326657. Fax : 0 246 2329422