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Treatment of Cerebral Palsy (CP) in Japan

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A Concept "Ryoiku" and institutions for physically disabled children

The idea "Ryoiku" has been established by Takagi on 1924.
"Ryoiku": Children receive not only medical care but also guidance on their daily life that helps preparing the children to lead an independent life in the future.Institution:The institution has two functions ; treatment (medical care) and education (school) by combining the hospital to the school.

1. Medical center

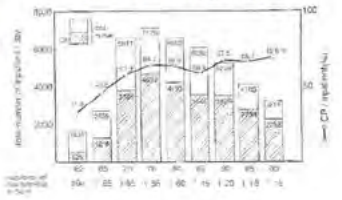
Orthopaedic surgeon and pediatrician work closely with each other to provide the most appropriate treatment, physical therapy, occupational therapy, speech therapy, psychological analysis incorporate in training to recover functions and promote patients adaptation to society.

2. School

Special education and occupational training are available at the school including kindergarten, compulsory school and / or high school.

First institution based on the concept "Ryoiku" has been built at Tokyo on 1942. The number has increased since the first institution. 56 institutes were developed at each prefecture of Japan on 1963 under the Child Welfare Law. The diseases and number of inpatient through 1962 to 2000 are shown on the following charts (right side).

Number of CP and total inpatient/day in the centers for disabled children (1962-2000)



B Surgical treatment: Institution of orthopaedic selective spasticity-control surgery .

Introduction of Orthopaedic Selective Spasticity-control Surgery (OSSCS). During the past 20 years, revolutionary advances have been made in the treatment of cerebral palsy. While analyzing the muscle activities in normals and patients with cerebral palsy, we have also made every effort in developing effective orthopaedic surgery and established an approach to control spasticity called "Orthopaedic Selective Spasticity-control Surgery (OSSCS)".

OSSCS is an approach to control spasticity selectively, while preserving antigravity activities. The working hypothesis of this approach is that the multiarticular muscles have less antigravity and more propulsive activity while the monoarticular muscles have more antigravity and less propulsive activity(Fig. 1, 2).
The multiarticular flexors and extensors are selectively released and hypertonicity of these muscles are reduced (Fig. 3). The monoarticular muscles are preserved.

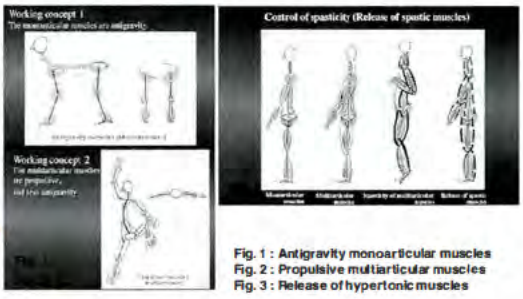


Fig. 1 : Antigravity monoarticular muscles
Fig. 2 : Propulsive multiarticular muscles
Fig. 3 : Release of hypertonic muscles

On this 10 year-old female, OSSCS was conducted on both the hips and knees. Preoperatively, marked crouched posture was observed with flexion and adduction deformity of the hips and flexion deformity of the knees (Fig.4A). Postoperatively, crouched posture was lessened. He is now ambulatory with crutches (Fig.4B).

On this 30-year-old male with athetosis who complained of radiating pain and sensory deficit in the right upper extremity, OSSCS was conducted on the neck. After OSSCS, involuntary movements of the head and neck decreased markedly, showing that the athetosis was significantly controlled (Fig. 5AB).

Fig. 4A, B : OSSCS of the hips and knees

Fig. 5A,B : OSSCS of the neck (Radiculopathy)

As shown in Fig. 6 A,B, athetosis of the hand and fingers can also be controlled and voluntary movements can be facilitated (Clinical Orthopaedics 384 : 111-111).

Thus, OSSCS seems to be useful, allowing selective control of spasticity with most promising results. However, understanding of specific functions of the muscles and the applications of selective muscle releases are indispensable for attaining excellent results.

Please refer to Poster Session 11-P16 and Book" Orthopaedic Selective Spasticity-control Surgery. Soufusha, Tokyo, 2001".

Fig. 6A, B : OSSCS of the hand and fingers

C Physical therapy: The Ueda method:A new approach to the cerebral palsy

The Ueda method is a physical therapy to decrease spasticity or hypertonus in cerebral palsied children. It was invented by Tadashi Ueda, a Japanese pediatric orthopaedic surgeon, and published in 1988. Nowadays in Japan, lots of physical therapists and occupational therapists treat children with spastic cerebral palsy based on this method. Recently, it is coming into wide use also in China.

The rationale of this method is in the first place that spastisity or hypertonus is responsible for the abnormal postural reflex pattern, and not vice versa, and in the second place that normal righting and equilibrium reactions are not be facilitated by giving normal movement experiences, but ought to be released spontaneously due to the decrease of spasticity.

The Ueda method consists of five elemental techniques ; technique for the neck (Fig. 7), the trunk (Fig. 8), the upper extremity (Fig. 9), the lower extremity (Fig. 10-A,B) and the shoulder girdle (Fig. 11). To hold just a reverse limb position that is observable in the child with cerebral palsy, which is abnormal, is originality with this method, being contrast with traditional views. For example, technique for the lower extremity is as follows. The therapist holds an ankle joint of the child in the maximally plantarflexed position for three minutes (Fig. 10-A), with the great toe plantarflexed as well (Fig. 10-b), then dorsiflexes and plantarflexes the ankle reciprocally twenty times, and finally again holds it in the position of maximal plantarflexion for three minutes . The treatment is carried out twice a day by parents.

Through treatment by this method, spasticity or hypertonus of the muscles can be reduced, and the effects of a treatment session continues for from several hours to a week. In many cases, after a treatment session, asymmetry of the neck and trunk are corrected, and deformities of extremities are also corrected. The neck righting reaction and the parachute reaction sometimes become positive. After the treatment, motor function of upper limbs often improve, and voluntary movement of lower limbs increase promptly. By reducing spasticity or hypertonus, many motor problems with cerebral palsied children can be resolved.

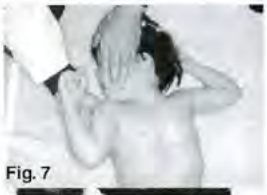


Fig. 7


Fig. 8


Fig. 9


Fig. 10-A


Fig. 10-B


Fig. 11