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Outcome of selective motor fasciculotomy in the management of lower limb spasticity due to cerebral palsy (a prospective cohort study in 23 children)

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Background and Objective(s): To assess the outcome of Selective Motor Fasciculotomy (SMF) on relief in lower limb harmful resistant focal spasticity and to measure the resulting changes in motor functions in children with cerebral palsy.

Study Design: Prospective cohort study.

Study Participants & Setting: This prospective cohort study included 23 children with cerebral palsy, age ranging from 5 to 18 (mean 10.21) years and M: F ratio is 5:1 having spasticity in the lower limbs.

Materials/Methods: All the children were assessed pre and post operatively by Modified Ashworth Scale (MAS), Selective Voluntary Control (SVC) grade and locomotor Abilities (knee walking, squat to stand, standing and walking). SMF was performed on obturator (n=8), sciatic (n=11) and tibial nerves (n=23) for the relief of spasticity in hip adductors, knee flexors and ankle plantar flexors in 4, 6 and 13 children respectively. These were followed for a mean of 30 (6–60) months. All the children were given physical therapy pre and post operatively.

Results: During a mean follow-up of 30 (6–60) months. There was a statistically significant reduction in spasticity (MAS, p<0.005) from 1.57 to 0.58, 1.92 to 0.08, 1.92 to 0.31 in hip adductors, knee flexors and ankle plantar flexors respectively. Pre and post-operative SVC grade also improved from 3.75 to 4.00, 4.08 to 4.17, 2.65 to 3.35 in hip adductors, knee flexors and ankle plantar flexors respectively but not significantly (p>0.005). There was no complications and spasticity did not recur during this period of follow up.

Conclusions/Significance: The SMF of obturator, sciatic and tibial nerves significantly relieves spasticity in the targeted muscles and thereby improves SVC and motor abilities in children having cerebral palsy. It is quite a safe procedure and the spasticity does not recur during a mean follow-up of 30 months.

SP 17
Brainstem and peri-Rolandic injury affects the practical way of feeding among the children with cerebral palsy due to basal ganglia and thalamic injury

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Background and Objective(s): Feeding difficulty is common and of great parental concern among children with cerebral palsy (CP) due to basal ganglia and thalamic (BGT) injury after perinatal hypoxic-ischemic encephalopathy. Besides oro-pharyngeal and laryngeal function, hand function is essential for self-feeding. To predict an appropriate way of feeding for each child with BGT injury, we investigated the influence of associated brain lesions such as brainstem and peri-Rolandic injury on the way of nutrient intake and hand function.

Study Design: Cross-sectional study.

Study Participants & Setting: A total of 131 term-born children with CP (aged between 3 and 20y, 67 boys and 64 girls) who had BGT injury confirmed by MR images.

Materials/Methods: Participants were divided into three groups by the way of nutrient intake; oral (n=81), oral and tube (n=32), and tube (n=18), or into two groups by the MACS level: 1–3 (n=19) and 4–5 (n=112). As for MR images, BGT injury was classified into mild, moderate, and severe under the criteria of a previous report. Associated hemispheric injury was classified into none, limited to bilateral peri-Rolandic areas, and extended (extensive cerebral lesions around watershed regions or multi-cystic encephalomalacia). Age at evaluation, gender, gestational age, birth weight, Apgar score at one and five minutes, severity of BGT and hemispheric injury, and existence of brainstem injury were compared by univariate analyses among three different way-of-feeding groups and between two MACS groups respectively. Then, logistic regression analyses were performed to elucidate the independent factors related to tube feeding and poor hand function.

Results: Gestational age of oral feeding group was significantly older than that of oral and tube feeding group (40±1.3 vs. 39±1.6, p<0.05). Apgar score at 1-minute in MACS level 4–5 group was significantly lower than that in level 1–3 group (3.0±2.6 vs. 5.2±3.0, p<0.01). Severity of BGT and hemispheric injury and existence of brainstem injury were all significantly associated with tube feeding and poor hand function. However, after logistic regression analyses, only existence of brainstem injury independently related to tube feeding (oral and tube: OR 5.2; p<0.01, tube: OR 12.5; p<0.01, respectively), and the existence of limited or extended hemispheric lesion was independently associated with poor hand function (OR 8.0; p<0.01).

Conclusions/Significance: This study confirmed that detection of associated injury on MR images is useful in planning appropriate rehabilitation program for feeding among the children with BGT injury. For those with isolated BGT injury, to improve their hand function is important for effective self-feeding. For those with BGT and peri-Rolandic injury, improvement of hand function is also necessary but not intended to self-feeding, and safe assisted feeding will be the practical goal. Early introduction of surgical intervention such as gastrostomy should be recommended for the effective long-term safe feeding among those with BGT and brainstem injury.