**Supplementary Digital Content**

 **Supplementary Digital Content 3.** **Chuang’s Cortical Adaptation Staging System**

|  |  |
| --- | --- |
| **Stages** | **Muscle Function** |
| Stage I | No movement |
| Stage II | Dependent movement |
| Stage III | Independent movement  |
| Stage IV | Spontaneous movement, with presence of involuntary movement |
| Stage V | Spontaneous movement, with little or no involuntary movement  |

**Tables**

Table 1: Movement Disorders in PPFS

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  Synkinetic MovementTriggerMovement | Frontal /corrugatorcontraction--> tension face | Orbicularis oculi contraction--> narrow eye | Levators of upper lip contraction --> mouth angle twitching | Depressors of lower lipcontraction--> lower lip retracted | Depressors of lower lipcontraction--> chin dimples | Platysma contraction-->neck bands |
| Forehead raise | (0) to (+++)\* | (0) to (+++) | (0) to (+++) | (0) to (+++) | (0) to (+++) | (0) to (+++) |
| Eye closure | (0) to (+++) | (0) to (+++) | (0) to (+++) | (0) to (+++) | (0) to (+++) | (0) to (+++) |
| Smile  | (0) to (+++) | (0) to (+++) | (0) to (+++) | (0) to (+++) | (0) to (+++) | (0) to (+++) |
| Lower lip pulled down | (0) to (+++) | (0) to (+++) | (0) to (+++) | (0) to (+++) | (0) to (+++) | (0) to (+++) |
| Lip pouting (whistling)  | (0) to (+++) | (0) to (+++) | (0) to (+++) | (0) to (+++) | (0) to (+++) | (0) to (+++) |

Severity of synkinesis (4 degrees): none (0) , mild (1+), moderate (2+) and severe (3+)

Table 2: PPFS Patient Demographics

|  |  |  |
| --- | --- | --- |
| Total No. patients  | 100 | Pts |
| Mean age (range), years  | 32.2 (6-73) | < 15 Y/O, 15-49 >50  | 6 7717 |
| Gender (Male/Female) | 36: 64 |
| Affected side (right : left) | 53:47 |
| Etiology  |
| Bell's palsy | 35 |
| Trauma  | 22 |
| Infection  | 19 |
| After tumor resection | 18 |
| Facial nerve injury and repair | 4 |
| Other (brain infarction) | 1 |

Table 3. Deformities following FFMT

|  |  |  |  |
| --- | --- | --- | --- |
| Location | Deformity | Surgical Correction  | Incidence (pts) |
| Upper lip | Contracture of mouth angle or upper lip with abnormal deep fold formation | 1. release of contracture and dermafat graft2. TFL cheek skin suspension 3. V-Y plasty or Z-plasty4. botox5. selective neurectomy of the affected facial nerve6. lip adhesion (2 stages)  | 14 |
| 9 |
| 10 |
| 4 |
| 2 |
| 5 |
| Wide vermilion | Thinning procedure | 5 |
| Cheek  | Bulkiness  | 1. debulking2. gracilis upward advancement | 5 |
| 2 |
| Uneven surface  | Rigotomy and fat grafts | 18 |
| Deep nasolabial fold/Marrionette line  | 1. rigotomy and fat graft2. TFL cheek skin suspension3. V-Y plasty or Z-plasty | Overlapped |
| Abnormal facial wrinkles | Rigotomy and fat grafts | Overlapped |
| Eyelid | Corrugator muscle hypertrophy | Corrugator resection | 9 |
| Ptosis | Browlift | 2 |
| Lagophthalmos | 1. lateral tarsorrhaphy2. temporalis muscle transfer3. FFMT | 5 |
| 1 |
| 5 |
| Asymmetry | Double eyelid formation | 8 |
| Lower lip | Asymmetry | 1. wedge resection of the lower lip2. myectomy of the healthy side depressors | 2 |
| 6 |
| Drooling/dimpling | 1. wedge resection2. plantaris tendon suspension3. dermofat graft  | 2 |
| 1 |
| 1 |
| Tight band | Release of aponeurosis or plantaris tendon | 2 |
| Others | Hypertrophic scars | Scar revision | 1 |

FFMT, functioning free muscle transplantation

Table 4. Advantages and disadvantages between Selective Neurectomy and Aggressive Surgical Procedures

|  |  |  |
| --- | --- | --- |
|  | Selective Neurectomy | Aggressive Surgical Procedures |
| Representative  | Azizzadeh B | Chuang DCC |
| Advantages | 1. Simple operation (neurectomy)
2. Quick surgery (2-3 hrs)
3. Less scars
4. Less facial disfigures postoperatively
 | 1. Technique: complex but straight forward
2. Usually no need of BTX-A
3. Usually no need for simultaneous rhytidectomy
4. 2nd deformity can be easily corrected by revision surgery (usually performed at one year postoperatively)
5. Results: predictable and long-lasting
 |
| Disadvantages  | 1.Technique: difficult in decision making, and unpredictable results2.High need for adjuvant surgery such as rhytidectomy, fat grafting3. Continues need BTX-A treatment4.Timing of revision surgery: uncertain (immediately or days later?)  | 1.Complex operation (neurectomy + myectomy + reconstruction) 2. Long surgery (6-10 hrs)3.Need micro-neural- vascular anastomoses4.More operative scars5.High rates of revision surgery |