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Emotional training after facial nerve palsy: from theory to practice

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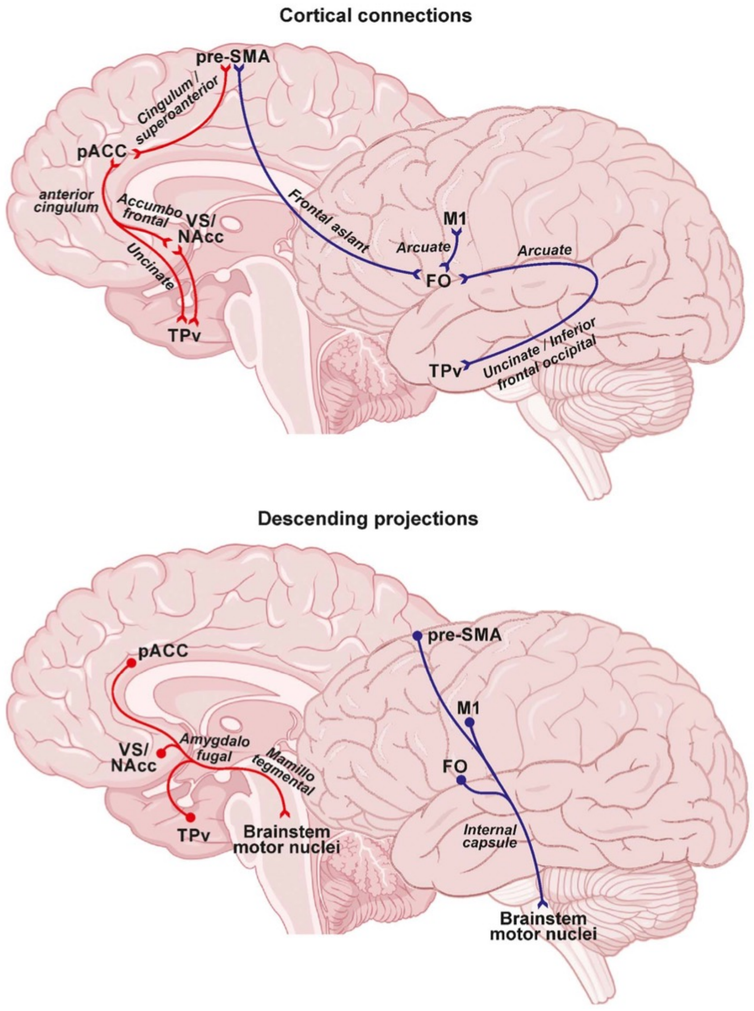
BACKGROUND

Facial expressions can be either **voluntary** or **emotionally controlled**.
According to the Component Theory of facial expressions, the **upper** and **lower face** motor control is behaviorally independent in adults. In addition, the **right** and the **left face** may also exhibit partially independent motor control.

Spontaneous facial expressions are organized predominantly across the horizontal facial axis and secondarily across the vertical axis.

Two neural networks for laughter have been recently described in a tractography study.
One network is involved in producing **emotional laughter** (the pregenual anterior cingulate, ventral temporal pole and ventral striatum/nucleus accumbens - **red arrows**), while the second one in **non-emotional and conversational laughter** (frontal operculum and primary motor cortex M1 - **blue arrows**).



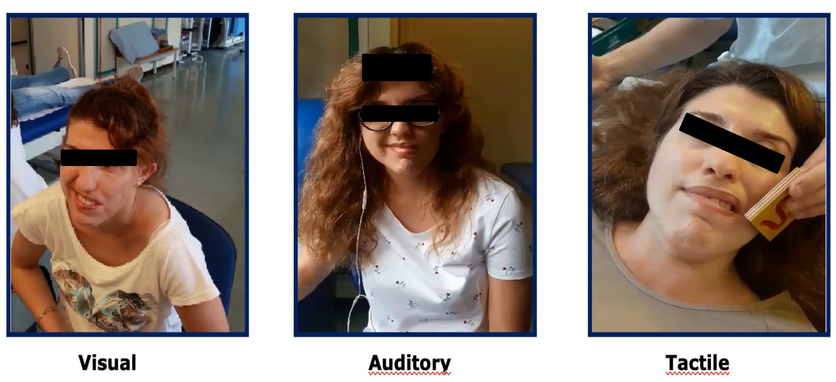
Smile production and recognition of others' smiles are encoded in the pregenual anterior cingulate cortex.
Unlike hand mirror neurons (MNs), mouth MNs do not receive their visual input from parietal regions. Facial visual input could reach mouth MNs through the ventrolateral prefrontal cortex. Other strong connections derive from limbic structures involved in encoding emotional facial expressions and motivational processing. **The mirror mechanism linked to the face motor control is connected with limbic structures, involved in communication and emotions**.

DISCUSSION

Peripheral paralysis of the facial nerve compromises facial motility, resulting in **alterations in facial expressions,** particularly in representing emotionality and non-verbal communication.

The primary therapeutic goal of rehabilitation treatment should be to recover expressive gestures, characterized by a biological function and facial expressions for non-verbal communication.
A rehabilitation protocol could be based on **neurocognitive exercises with an emotional component** (***emotional training***) to recover spontaneous and emotional expressive movements. The patient is asked to reproduce the movements to express different emotions by showing ***drawings*** or ***photos of faces***, by ***reproducing the examiner's expression*** or by ***imaging a situation that evoked a specific emotion.***

The different sensory channels can be used: ***visual*** (viewing photos or videos that arouse a particular emotion), ***auditory*** (listening to emotionally significant music), ***tactile*** (touching surfaces that evoke a pleasant feeling) and ***gustatory*** (tasting some favorite foods).



Even ***functional exercises***, such as producing movements with the mouth (e.g. blowing) or the other parts of the face, can be proposed in contexts with emotional connotations (e.g. imagine blowing candles at a birthday party).

CONCLUSION

After a facial paralysis, **once voluntary contraction appeared, neuromotor treatment should be integrated with emotional training** which is a promising rehabilitation proposal that radically changes rehabilitation intervention.

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