AUTOLOGOUS SPINAL CORD TRANSPLANTATION WITH OLFACTORY MUCOSA GRAFT – A PROMISING REGENERATIVE TREATMENT FOR SPINAL CORD INJURY

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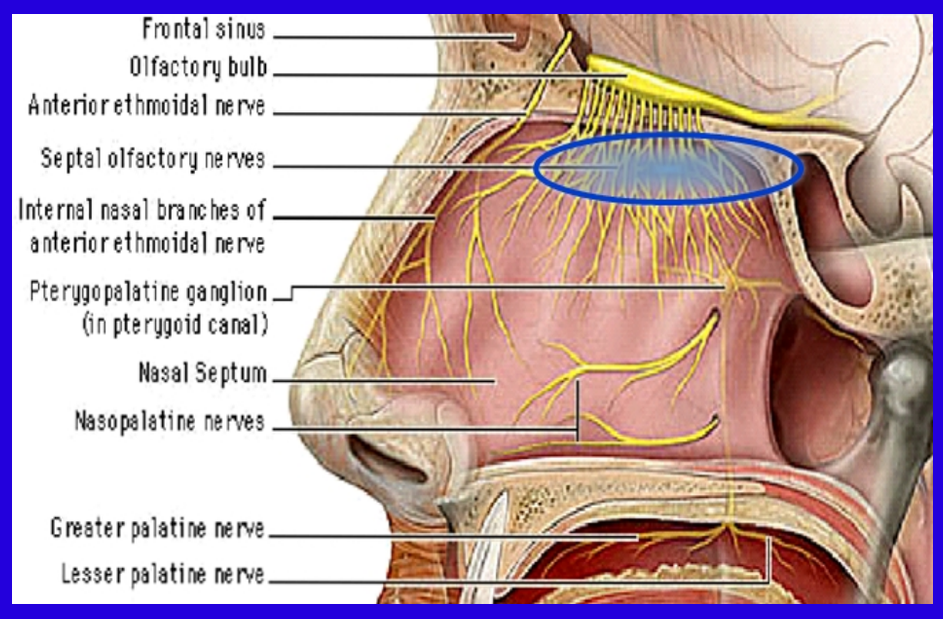
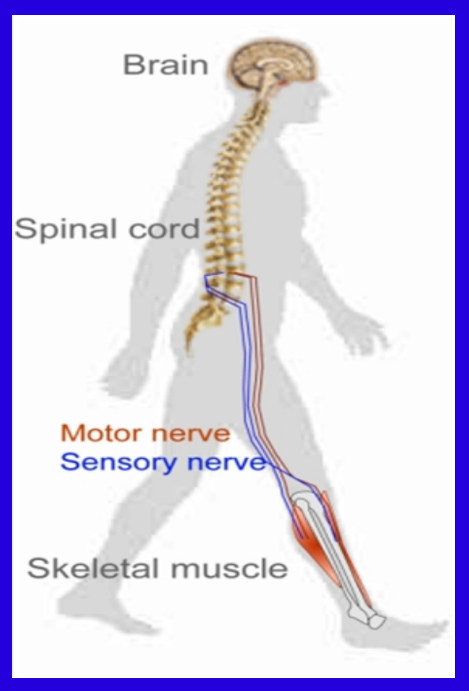
INTRODUCTION

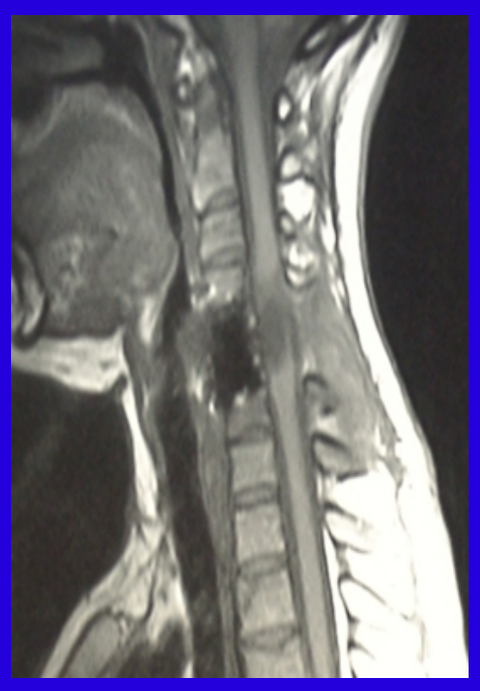
Transplantation of embryonic neural tissues was introduced as a technique of damaged neuronal circuitries repair since the late 1970s, however due to ethic issues, research has recently been focused on stem cells transplantation, such as olfactory mucosa neurons.



PATIENTS & METHODS

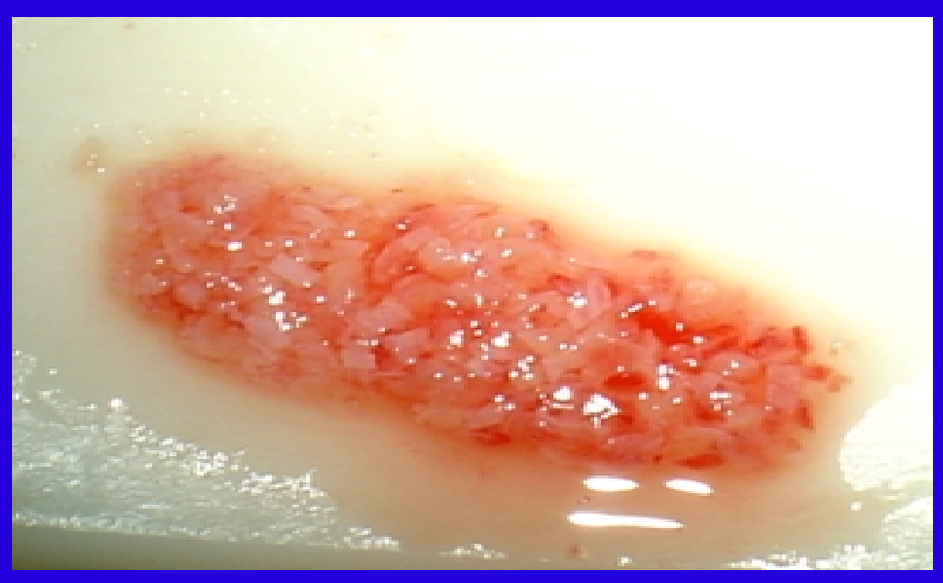
Patients with complete paraplegia (ASIA grade A or B) due to spinal cord injury more than 6 months previously and with less than 3cm vertical extent of cord injury on MRI, have been included in a relevant clinical trial at the Neurosurgery Department of Osaka University Hospital. The patient's olfactory mucosa graft is taken endoscopically and then processed into small pieces. Afterwards, spinal cord's posterior medial sulcus is opened, the scar is removed and the autograft is transplanted into the cavity.





RESULTS

Patients have demonstrated electromyographic signals in response to voluntary effort as early as 3 months after the transplantation, while emergence of motor evoked potential has also been observed, indicating the recovery of electrophysiological conductivity of the corticospinal tract. Moreover, some patients have shown improvement in motor function below the level of injury.



CONCLUSIONS

The neural condition of the severed caudal spinal cord seems to influence the potential for motor function recovery, while the time interval between injury and transplantation does not seem to be an important factor since improvement from ASIA grade A to grade D has been achieved in one patient even when the transplantation was performed ten years after the injury. Involuntary muscle spasm before transplantantion seems to be a predictor of success of regenerative treatment in chronic spinal cord injury patients.