

Abstracts from international literature

Chinese

A new biodegradable conduit for nerve reconstruction: an experimental study on rats

F. Xie, Q.F. Li, L.S. Zao

Chin J Plast Surg 2005; 21(4): 295–298

The use of a conduit technique is one of the potential methods to improve the functional results of nerve repair. Lack of the ideal material with good physical and biocompatible property for the nerve conduit hinders its clinical application. This paper focused on an experimental study of a new conduit made from a composite of polylactic acid (PLA) and chitosan to repair the rat's peripheral nerve defects.

Thirty rats (4 months old, male, 300–350 g weigh) were randomly divided into three groups with 10 in each group. Group A was repaired with the chitosan-PLA composite nerve conduit of 1.5 mm-in-diameter and 10 mm-in-length. Group B was to reconstruct the nerve defect with a silicone conduit of 1.5 mm-in-diameter and 10 mm-in-length. Group C was to repair the nerve defect with a reverse autogenous sciatic nerve graft. A 5 mm-in-length sciatic nerve defect was surgically created on each animal. The 10 mm long tube was sutured to the proximal and distal end of the nerve leaving a minimum of 5 mm gap between the two ends in both Group A and Group B. In Group C, a 5 mm nerve graft was removed from the sciatic nerve, the graft was reversed and sutured end-to-end back to repair the defect. During the post-operative period, any complications that occurred were recorded. These included bleeding, infection and limited motion of the hind limbs. Twelve weeks post-operatively, general examinations were performed including movement of hind limb, vola stimulation by needle pricking. The rats were anesthetized and each repaired sciatic nerve was exposed and the electromyography (EMG) of the triceps surae muscles was

tested. Then the rats were sacrificed and the bridged sciatic nerves were harvested for histological examination.

The wounds of the rats gained primary healing and no infection or death can be detected. At the end of 12 weeks postoperatively, the rats in Groups A and C showed more sensitivity to the needle pricking stimulation than those in Group B. The gross examination showed that the regenerating nerve succeeded to bridge the gap and innervated the muscle. The cross sectional areas of the regenerated nerves were ($0.68 \pm 0.17 \text{ cm}^2$) in Group A, ($0.36 \pm 0.15 \text{ cm}^2$) in Group B and ($1.36 \pm 0.44 \text{ cm}^2$) in Group C. In Groups A and C, plentiful of regenerated axons were found surrounded by myelin sheath with no neuroma detectable at the bridging nerve. In Group B, the regenerated axons were sparse and neuroma-like formation was found at the anastomosis points. The PLA-chitosan conduit in Group A was only partly degraded by the end of 12 weeks post-operatively. The EMG results showed that the nerve conduction velocity of the sciatic nerve in Groups A and C was greater than that in Group B, but there were no differences between Groups A and C.

The authors concluded that no significant difference was found in the nerve reconstruction between the PLA-chitosan composite biodegradable conduit group and the autogenous nerve graft group. The PLA-chitosan conduit could repair a defect of a peripheral nerve successfully in rats and seemed to be one of the ideal materials for nerve conduit. Further study is needed prior its recommended clinical applications.

XUDONG WANG

German

Feasibility of combined surgical and brachytherapy for advanced recurrent malignancies involving the skull base

R.J. Strege, G. Kovacs, S. Maune, D. Holland, P. Niehoff, T. Eichmann, H.M. Mehdorn

Strahlenther Onkol 2005; 181: 97–107

The purpose of this study was to assess the technical feasibility and toxicity of combined surgical resection and peri-operative intensity-modulated fractionated interstitial brachytherapy (IMBT) in advanced-stage malignancies involving the skull base in order to preserve the patients' vision. A total of 18 consecutive patients were included in this study: ten with paranasal sinus carcinomas, five with sarcomas, two with primitive neuroectodermal tumors (PNETS), and one with parotid gland carcinoma. After extensive but in most cases subtotal surgical resection, 2–12 (mean 5) “after loading” plastic tubes were placed into the tumor bed. IMBT was performed with an iridium-192 stepping source with pulsed-dose-rate/high-dose-rate (PDR/HDR) “afterloading” technique. The total IMBT dose, ranging from 10 to 30 Gy, was administered in a fractionated manner (3–5 Gy/day, 5 days/week). Peri-operative fractionated IMBT was performed in 15 out of 18 patients and they were well tolerated. Complications that partially prevented or delayed IMBT in some cases included: two cerebrospinal fluid leakage, two meningitis, two frontal brain syndrome, two afterloading tube displacement, one seizure and one general morbidity. No surgical or radiation induced injuries of the cranial nerves or eyes had occurred. The median survival time was 33 months after diagnosis and 16 months after combined surgery and IMBT. Peri-operative fractionated IMBT after extensive but vision preserving tumor resection seemed to be a safe and well tolerated treatment of advanced/recurrent malignancies involving the skull base. Based on these preliminary data the authors suggested that combined surgical resection and peri-operative fractionated

IMBT is a palliative therapeutic option in the management of advanced-stage malignancies involving the skull base.

GWEN SWENNEN

Turkish

Clinical evaluation of maxillary sinus morphometry by computerized tomography

M. Büyüktan, G. Kökten

J Den Fac Istanbul Univ 2005: (39): 15–19

In this clinical investigation, morphometric characteristics of maxillary sinus in a Turkish population were evaluated. Maxillary sinus can be subjected to various pathological conditions and surgical interventions, such as Caldwell-Luc operation, functional endoscopic procedure, posttraumatic exploration, tumor and reconstructive surgery. Therefore a detailed understanding of the morphometric features and alterations in size of the anatomical region may further facilitate the planning and accurate execution of the surgery. Although several studies can be found from the literature of maxillary sinus, in regard to its dimensions, morphometric studies focusing at various levels as well as detailing the differences

in sizes have not widely described. In this study, CT images of 256 maxillary sinuses in 128 patients were evaluated for anatomical variations of the maxillary sinus bilaterally. Their age ranged from 20 to 66 and equal gender distribution was noted. Coronal and reformatted axial images were obtained starting from the anterior limit of the maxillary sinuses and anatomical form according to the Agnastopolou classification. The presence of bony septum, Haller cells, Onodi cells and the relationship between the antral and nasal floors were recorded. Asymmetric head positions were discarded from the study. The largest coronal section was used for the evaluation of maxillary sinus form. The anatomical findings revealed that 32% was parabolic, 27% was semi-elliptic, 27% was hyperbolic and 9% was conical in shape. The presence of septum within the antrum was mostly located in the anterior wall of the maxillary sinus and it was commonly orientated parallel to sagittal plane. A variety of atypical septa could be detected and the incidence of partial septa was 10%. Haller cells were noted to locate mainly in anterior ethmoidal sinuses beneath the orbital floor bilaterally in 10% in close association with the maxillary sinuses. However, Onodi cells, which were located in the posterior ethmoidal sinuses closely related to the sphenoid sinuses, were only detectable in two cases. The difference in maxillary sinus and nasal floor levels revealed that 87% of antral floor was inferiorly located with an average of 4.7 mm.

REHA KISNISI

Russian

Hypoxic training – an effective method to improve the viability of local skin flaps

A.I. Nepobeev, N.A. Nagagianian, A.I. Elfimov, A.B. Shehter, A.I. Volojin, A.A. Kibisheva

Stomatologuia 2006: 2: 40–44

The authors have established an experimental model in rats, in which they induced hypoxia in expanded skin flaps using a barocamera. It was shown that the expanded skins have less degenerative changes, better vascularization when compared with the normal skin, even when the hypoxic training was done immediately before the expansion. The flaps with the hypoxic trained skin healed better, with a better scar. This interesting study can have possible clinical applications in centers equipped with barocameras.

YOURI ANASTASSOV