

The gliding of peripheral nerves. Anatomical basis and clinical significance.

Millesi H. - Millesi Center Vienna
Pelikangasse 15
A-1090 Vienna, Austria
Phone: +43 1 40180 2340, Millesi@wpk.at

Schmidhammer R – Millesi Center Vienna and Ludwig Boltzmann Institute for Traumatology,
Pelikangasse 15
A-1090 Vienna, Austria

Hausner T. – LKH Hainburg, and Ludwig Boltzmann Institute for Traumatology
Donaueschingenstr 13
A-1200 Vienna Austria

BACKGROUND Compression syndromes of peripheral nerves are well known and have been described for different nerves and different locations. There are good reasons to believe that at an entrapment site compression alone does not cause the symptoms but especially in early phases the nerve is stuck at the entrapment site and cannot move.

MATERIAL Cadaver studies to visualize the passive motion of nerves at different sites respectively the motion of other structures on top of the nerves during typical movements of the extremities.
Macroscopic and microscopic studies of the loose tissue around the nerve outside the epineurium which links the nerve to the surroundings. Such tissue was described by Johannes Lang [1] as conjunctiva nervorum and Krstic [2] as Paraneurium.
Macro- and microscopic studies of the surgical site in patients with corresponding pain syndromes was carried out and the gliding tissue studied. Microsurgical neurolysis frequently caused recurrent fibrosis. Gliding tissue flaps were developed and applied in a series of cases to envelope the nerve after neurolysis

RESULTS The length of the bed of the median nerve from the axilla to the hand differs by about 20% between flexion and extension [3]. The nerve has to move in longitudinal direction. If movement is impaired by fibrosis a pain symptom developed. In cases of a recurrent fibrosis neurolysis followed by envelopment of the nerve by a specially designed gliding tissue flap provided freedom of pain.

CONCLUSION By irritation due to various causes the tiny gliding tissue becomes fibrotic and loses the ability to provide frictionless gliding of nerves against the surrounding tissues. This fact is painful and causes a pain syndrome. In severe cases an envelopment of the nerves in a gliding tissue flap is necessary to avoid a recurrent fibrosis.

REFERENCES

- [1] Lang J, Über das Bindegewebe und die Gefäße der Nerven, *Anatomie und Embryologie*, 123, 61-79, 1962
- [2] Krstic R. *Die Gewebe des Menschen und der Säugetiere*, Springer Verlag, Berlin, Heidelberg 1978.
- [3] Zöch G, Reihnsner R, Millesi H, Elastic behavior of the median and the ulnar nerve in situ and in vitro., *Handchirurgie, Mikrochirurgie und Plastische Chirurgie* 21(6), 306-309, 1989

Presented at the 3rd International Fascia Research Congress
April 2012 Vancouver, BC, Canada