DECELLULARIZED NERVE: RESEARCH OF THE MORE RELIABLE METHOD

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INTRODUCTION
Peripheral nerve injuries are more than 70% of upper limb traumas, in case of large defect end to end suture is not possible and conduit is not enough to obtain a good result, the gold standard is the autograft, but this solution presents disadvantages: donor site morbidity and longer surgery time, allograft could be the correct alternative but nerves from specimen cause immunogenic response. Starting from 1980 several authors are looking for the correct way to decellularized nerves preserving extracellular matrix and basal lamina to improve nerve regeneration. It is available on the market an acellular nerve graft but in Italy a recent law prohibited to commercialize human tissue for profit.

METHODS
From a literature review (1, 2) we concluded that the best method to kill cells and to remove cell debris is the chemical one, because it is able to maintain PRESERVED BASAL LAMINA AND COLLAGEN, those are indispensable for nerve regeneration. The two protocols we used are: Rizzoli decellularization Protocol, and Lovati decelullazization protocol, both of them are a CHEMICAL PROTOCOL, but the first one ads SONYCATION, the second one a DNA-SE ENZYME.

We choose to decellularized human (median and ulnar) and rats (sciatic) nerves; we used 10 segments of 2 cm each: 8 segments are processed by chemical procedure (4 with Rizzoli, 4 with Lovati), one will be analysed immediately, one after 14 days, one after one month and the last after 3 months of storage, 2 segments are used as a control group and they are immediately analysed.

RESULTS
We have processed and evaluated with optic and electronic microscopy human nerves and sciatic rat nerves; these are our preliminary resuts

CONCLUSION
The purpose of this study is to identify a method of decellularization easy, cheap, standardized, that permits to obtain a complete removal of immunogenic elements maintaining an intact basal lamina to help axon regeneration; we think that Lovati method is the one that better removes cell debris preserving extracellular matrix, BUT even with this method cellular component are still present and an immunogenic response is possible.

BIBLIOGRAPHY