Brachial Plexus injuries associated with vascular lesions: primary vs secondary repair
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Objective
Axillary vascular lesions associated with brachial plexus injury pose difficult decisional problems about the moment and the type of microsurgical reconstruction. Treating this kind of lesions at the same operative time has some strong advantages and should be regarded as standard.

Methods
82 cases of brachial plexus injuries were selected from which 27 had associated axillary neuro-vascular lesions and were treated by a mixed team: vascular surgeon – microsurgeon. Axillary artery reconstruction was done with saphenous vein interposition grafts in 25 cases and with PTFE grafts in 2 cases.

In 21 cases vascular reconstruction was performed immediately and in 6 cases after 24-48 h, delayed emergency.

Nerve lesions were located at the level of cords in 19 cases, retroclavicular in 3 cases and supraclavicular lesions in 5 cases. Retro- and infraclavicular nerve lesions were treated primarily in 19 out of 21 cases by external neurolysis and neuroraphy, the reconstruction for the other 2 being through secondary nerve grafting.

Spraclavicular lesions especially in elongation and avulsion injuries required secondary reconstruction through combined methods: nerve grafts, nerve transfers (intercostals ± phrenic) and palliative muscular transfers (one pectoralis major, two latissimus dorsi and two triceps).

Patients were reviewed at 6, 12 and 36 months postoperatively. The mean age of the patients was 29 years. The average posttraumatic interval prior to surgery was 6-9 months. Muscular reinnervation was evaluated according to BMRC scale.

Emergency repair patients presented M3-4 results on BMRC scale in comparison with secondary reconstruction patients with rezults M1-2.

Results
Neurological recovery was better in primary cases than in secondary reconstructions and nerve dissection was more difficult in these late cases due to scarring and the risk of iatrogenic vascular lesion.

Emergency repair of both vascular and nervous lesions is mandatory. Even if the evaluation of the nerves lesions dimensions is difficult in emergency, the clinical experience of the surgeons in replantations and reconstructions of the severe damaged tissue, allows - in many cases - a reasonable evaluation of nervous tissue which is going to be sacrificed or not. Lesions evaluation in combined surgical approach with vascular surgeon and microsurgeon is the best surgical attitude towards this kind of trauma avoiding scared tissue and allowing good anatomy viewing and restoration. Primary reconstruction avoids difficult scar tissue dissection, large nerve graft reconstruction.

Conclusions
In conclusion combined neuro-vascular axillary lesions should be treated by a mixed team – vascular surgeon + microsurgeon – with primary repair of all structures as stated by G. Brunelli. Except for elongation lesions, the other type of brachial plexus injuries associated with axillary vascular lesions worth repairing in immediate emergency after vessel repair or in delayed emergency (5-7 days) after patient stabilisation, can lead to better clinical results than secondary reconstruction. This strategy avoids iatrogenic injury to the vascular graft possible and the difficult dissection in secondary brachial plexus repair. Primary repair by mixed surgical team guarantees the best functional results in complex cases.