Outcome measurements and functional benefit in brachial plexus surgery

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Objectives:
After reconstructive surgery in brachial plexus surgery a long term follow up of several years is necessary to record definite results. Published data for these cases show quite different standards in recording and measurement of the outcome. Therefore studies are of limited comparability. Mostly only one item (Range of motion, muscle force, pain or function) is reported. Due to the low number of cases and the wide surgical spectrum for treatment it seems necessary to agree on a common standard for follow-up after brachial plexus surgery. As remarked from several authors it important to know the surgical effect on five items:

- force
- active range of motion
- sensibility
- pain
- function

More than 50 patients after plexus lesions with different surgical treatment were long term observed. For shoulder and elbow function range of motion as well as muscle force were reported, while for the wrist and hand mostly functional items were examined. Comparing own results with the literature showed the limited validity. Thus critical assessment of own results could not be performed satisfactory. With a common standard any meta-analysis would show increases validity.

Method:
Based on this experience a draft for a combined chart to report functional and measurable results in a short and effective way was developed. It considers range of motion for the most important functions, muscle force, functional items, pain and sensory quality. Due to limited resources the chart include only aspects with practical importance for usability of the arm in daily life. Active movements are scored without respect to the different involved muscles, which especially for the shoulder are difficult to discriminate.

The chart can be used for the same patient at several times of re-evaluation to show the individual development and to compare with the situation before surgery. While pain, sensibility, force and range of motion can be examined or described with common standards, a common idea to measure function after plexus surgery is not developed. The DASH-Score seems not to be appropriate for these patients. Own experiences showed quite different DASH-results for patients with similar measurable results. So for the first draft of a standardized examination after plexus surgery DASH-score was dropped.

Conclusion:
The results in reconstructive brachial plexus surgery need to be comparable better with respect to function in daily life. Nevertheless measurable items are necessary to objectify the findings. A standardized chart to report long term results might help to support multicentric evaluation of defined surgical procedures or schemes of treatment and will be introduced for discussion.