Psychosocial Assessment Procedure for Bionic Reconstruction in Patients with Global Brachial Plexus Injuries

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Objective

Global brachial plexopathies cause major sensory and motor deficits in the affected arm and hand and lead to numerous psychosocial consequences including chronic pain, decreased self-sufficiency, and poor body image [1–3]. Bionic reconstruction, which includes the amputation of the functionless limb, has been shown to restore hand function in patients where classic reconstructions have failed [4, 5]. Patient selection and psychological evaluation before such a life-changing procedure are crucial for optimal functional outcomes. Here we introduce a standardized psychological assessment procedure [6] for bionic reconstruction in patients with complete brachial plexopathies.

Patients and Methods

Between 2013 and 2017 psychosocial assessments were performed in eight patients with global brachial plexopathies at the Christian Doppler Laboratory for Restoration of Extremity Function. The psychosocial assessment procedure [illustrated in Fig 1.] consists of a semi-structured interview and three patient-reported questionnaires addressing mental health and social functioning, deafferentation pain and body image (SF-36; VAS; FKB-20). The assessment is administered 1 month to 1 week prior to amputation and has the intent to identify patients who do not qualify for bionic reconstruction due to psychological difficulties (e.g. Posttraumatic Stress Disorder, substance abuse), due to unfavorable motives (e.g. pain being the primary reason for amputation) and/or unrealistic expectations of prosthetic reconstruction as well as low compliance or adherence. Finally, the effect of bionic reconstruction on these parameters was analyzed over time.

Results

Pre-operative qualitative data revealed several psychological stressors with long-term negative effects on patients with complete brachial plexopathies. For example: in interview section A seven of eight patients (88%) reported inadequate pain management during primary care, in none of the patients symptoms of a PTSD were encountered at the time of the assessment. In interview section C the most encountered stressor was constant pain. None of the patients reported dissatisfaction with their social environment and family support. In section D three patients (38%) reported problematic motives, mostly because they feared ambiguous reactions to an amputation. Most patients (88%) had good information level about prosthetic hands but two patients (25%) perceived social reactions to such a prosthesis. After bionic reconstruction the physical component summary scale (SF-36) increased from 30.80 ± 5.31 to 37.37 ± 6.41 (p-value = 0.028), the mental component summary scale (SF-36) improved from 43.19 ± 8.32 to 54.76 ± 6.78 (p-value = 0.018).VAS scores indicative of deafferentation pain improved from 7.8 to 5.6 after prosthetic hand replacement (p-value = 0.018). Negative body evaluation (FKB-20) improved from an average mean value of 60.71 ± 12.12 to an average mean value of 53.29 ± 11.03 (p-value = 0.075). Vital body dynamics increased from 38.57 ± 13.44 to 44.43 ± 16.15 (p-value = 0.109).

Conclusion

Bionic reconstruction provides hope for patients with complete brachial plexopathies, improves overall quality of life and reduces deafferentation pain. Critical patient selection is crucial since high levels of adherence and compliance to a stringent prosthetic rehabilitation protocol determine optimal functional outcomes. The Vienna psychosocial assessment procedure can be seen as a first step to a standardized procedure.

References


Fig 1. Scheme illustrating the treatment algorithm of the Vienna psychosocial assessment procedure [6].