Abstract

Consequences of latissimus dorsi transfer on shoulder function


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Objectives: The latissimus dorsi is one of the largest muscles in the body. This muscle recognizes many applications in reconstructive surgery [1]. Since its introduction, the technique of latissimus dorsi myocutaneous flap breast reconstruction has yielded results characterized by excellent tissue vascularity and low donor site morbidity [2]. This study was undertaken to determine the functional consequences associated with the latissimus dorsi muscle donor site.

Methods: Twelve women (mean age of 50.1 ± 7.5 years) were studied before and up to 3 months after a latissimus dorsi transfer following mastectomy (one woman sustained a bilateral musculo-tendinous transfer), six of the thirteen shoulders sustained a 6 month follow-up. They sustained a bilateral isokinetic shoulder assessment involving the internal (IR) and external (ER) rotators and the abductor (ABD) and adductor (ADD) muscles. The ER-IR were tested in a lying supine position (45° of abduction in the frontal plane) at 60°/s and 240°/s in the concentric mode. The ABD-ADD were assessed in a newly designed lying lateral position between 0° and 90° of abduction in the frontal plane at 60°/s and 180°/s in the concentric mode [3]. The passive goniometric range of motion was measured in flexion, extension, internal and external rotation with shoulder placed either at 0° or at 90° of abduction. The subjective pain was evaluated by means of a visual analogic scale (VAS) before and after isokinetic assessments. The subjects also benefited from specific clinical testing of conflict (Hawkins, Yocum and Neer test) on both shoulders.

Results and Discussion: Six months post-surgery, patients recovered a subnormal passive mobility, with only the external rotation at 0° of abduction standing significantly inferior (p < 0.05; 7%) in comparison with the contralateral healthy shoulder. They did not describe any complaints through the VAS either before or after the isokinetic measurement except for one woman who presented a slight pain before and after the strength assessment (2.2. and 3.7 respectively on the VAS). Four out of thirteen operated shoulders (three months follow-up) and three out of six (six months follow-up) showed a Hawkins and/or Yocum positive testing.

Three months after the latissimus dorsi transfer, the affected shoulder developed a significant (p < 0.05) weakness on the IR (16.8 ± 10.6% at 60°/s), the ADD (38.6 ± 12.5% at 60°/s) and the ABD (9.3 ± 12.4% at 60°/s) in comparison with the pre-surgery strength profile. Hence, compared to the healthy side, the operated shoulder showed a significant (p < 0.05) decrease of strength on the IR (14.8 ± 21.4% at 60°/s) and ADD (37.3 ± 9.4% at 60°/s). No improvement occurred within the 6 months follow-up group and they still presented a significant (p < 0.05) deficit six months after surgery (20.9 ± 12.9% on the IR; 37.1 ± 7.9% on the ADD; 17.9 ± 10.9% on the ABD at 60°/s) in comparison with the non-operated shoulder.

The ER/IR and ABD/ADD concentric ratios were increased on the operated shoulder comparatively to the healthy side after surgery. For instance, at 3 months post-surgery, we obtained 0.96 ± 0.17 versus 0.68 ±
0.06 for the ER/IR ratio at 60°/s and 0.91 ± 0.13 versus 0.64 ± 0.13 for the ABD/ADD ratio at 60°/s (Fig. 1).

Conclusion: Three and 6 months after a latissimus dorsi transfer following mastectomy, the operated shoulder showed a significant weakness mainly in the IR and ADD muscles, entailing to higher ER/IR and ABD/ADD ratios in comparison with the contralateral side. In spite of a satisfactory passive motion pattern, some of these shoulders developed positive conflict signs.

References