Journal of Plastic, Reconstructive & Aesthetic Surgery (2014) 67, 1082—1088

JPRAS
An International Journal of Surgical Reconstruction
www.JPRASurg.com

Early complications, pain, and quality of life after reconstructive surgery for abdominal rectus muscle diastasis: A 3-month follow-up

P. Emanuelsson [a], U. Gunnarsson [b], K. Strigård [b,*], B. Stark [c]

[a] Department for Surgery, CLINTEC, Karolinska Institutet, Stockholm, Sweden
[b] Department of Surgical and Perioperative Sciences, Umeå University, Sweden
[c] Department for Molecular Medicine and Surgery, Karolinska Institutet, Stockholm, Sweden

Received 7 February 2014; accepted 16 April 2014

KEYWORDS
Rectus diastasis;
Early complications;
Retromuscular mesh;
Quill suture

Summary *Aim:* The aim of this study was to evaluate early complications following retromuscular mesh repair with those after dual layer suture of the anterior rectus sheath in a randomised controlled clinical trial for abdominal rectus muscle diastasis (ARD).
Methods: Patients with an ARD wider than 3 cm and clinical symptoms related to the ARD were included in a prospective randomised study. They were assigned to either retromuscular inset of a lightweight polypropylene mesh or to dual closure of the anterior rectus fascia using Quill self-locking technology. All patients completed a validated questionnaire for pain assessment (Ventral Hernia Pain Questionnaire, VHPQ) and for quality of life (SF36) prior to and 3 months after surgery.
Results: The most frequently seen adverse event was minor wound infection. Of the patients, 14/57 had a superficial wound infection; five related to Quill and nine to mesh repair. No deep wound infections were reported. Patient rating for subjective muscular improvement postoperatively was better in the mesh technique group with a mean of 6.9 (range 0—10) compared to a mean of 4.8 (range 0—10) in the Quill group ($p = 0.01$). The pre- and post-operative SF36 scores improved in both groups.
Conclusions: There was no significant difference between the two surgical techniques in terms of early complications and perceived pain at the 3-month follow-up. Both techniques may be considered equally reliable for ARD repair in terms of adverse outcomes during the early

* Corresponding author. Dep. of Surgery, Norrlands University Hospital, S-901 85 Umeå, Sweden. Tel.: +46 90 7850000; fax: +46 90 7852290.
E-mail address: karin.strigard@umu.se (K. Strigård).

http://dx.doi.org/10.1016/j.bjps.2014.04.015

postoperative phase, even though patients operated with a mesh experienced better improvement in muscular strength.

ClinicalTrial.gov: 2009/227-31/3/PE/96.

Introduction

Abdominal rectus muscle diastasis (ARD) is defined as an increase in the distance between the rectus muscles, or increased width of the linea alba. Pregnancy and obesity followed by massive weight loss are reasons for ARD. Some data associate ARD with reduction in muscle strength, clinically expressed as discomfort and/or trunk pain due to imbalance of the pelvic-lumbar muscular girdle.[1–3] Whether or not the width of the ARD has an influence on abdominal muscle strength, however, is not well documented. The benefits of repair regarding functional outcome and patient quality of life are other topics that need to be studied.

In 1997, the World Health Organisation declared obesity to be a global epidemic.[4] Around 8000 bariatric surgical procedures are performed each year in Sweden (www.ucr.uu.se/soreg). In many cases, reconstructive surgery is subsequently necessary because of functional impairment, with abdominoplasty being the procedure of choice. This global increase in need for abdominal wall reconstructive surgery following bariatric surgery raises the question whether or not ARD repair, to improve the functional outcome, is advisable in these circumstances.

Furthermore, what is the surgical technique most suitable for optimal functional results with the least postoperative complications? Many published reports focus on early complications following hernia repair,[5] but high-level evidence studies on patients with ARD are sparse.[6] ARD can be repaired using retromuscular mesh, the technique preferred by general surgeons, or by plication of the anterior rectus sheath, the method of choice in reconstructive plastic surgery. These two techniques differ as regards the degree of surgical trauma. The more extensive dissection required to place a retromuscular mesh, would lead one to expect a higher rate of postoperative complications such as seroma, infection or persistent pain.

The aim of this study was to evaluate early complications and patient satisfaction, comparing retromuscular mesh repair with dual layer suture of the anterior rectus sheath in a randomised controlled clinical trial. Patients eligible for the study were those experiencing discomfort and/or abdominal pain and had an ARD wider than 3 cm.

Material and methods

Study design

Patients presenting with discomfort and/or abdominal pain due to ARD of the ventral abdominal wall wider than 3 cm were eligible to participate in this prospective randomised study. They were assigned to either retromuscular inset of a lightweight polypropylene mesh (BARD™Soft Mesh) or to dual closure of the anterior rectus fascia using Quill™ SRS self-locking technology, PDO 2/0.[7] This was a joint study involving the Departments of Surgical Gastroenterology and Reconstructive Plastic Surgery, Karolinska University Hospital, Stockholm, Sweden. The intended sample size was based on the assumption that there was a clinically significant difference in 1-year recurrence rate between the two ARD surgical repair techniques, which was the primary endpoint of the background study. Power estimation was not performed for this part of the study, as the present report was based on outcome data regarding early complications. A flow-chart for the study is shown in Figure 1. Each patient completed a written informed consent prior to participation. Inclusion and exclusion criteria are listed in Table 1. The study was approved by the Regional Ethics Review Board in Stockholm (D.nr. 2009/227-31). The randomised trial from which the patients were recruited was registered at ClinicalTrial.gov with the number 2009/227-31/3/PE/96.

Patients

All patients included presented with a deformity type A according to the musculo-aponeurotic classification described by Nahas.[8] Of the 64 participating patients, 62 were women and two were men. Median age at surgery was 40 (range 25–60) years and the median body mass index (BMI) was 23 kg/m^2 (range 18–31). To fulfil the inclusion criteria, patients had to have an ARD of at least 3 cm clinically, and all underwent preoperative computed tomography (CT) scanning prior to randomisation for exclusion of intra-abdominal pathology. A complete medical history was recorded for each patient.

All patients completed a validated questionnaire for pain assessment (Ventral Hernia Pain Questionnaire, VHPQ)[9] and for quality of life (SF36)[10] prior to and 3 months after surgery. Patients grading VHPQ $\leq$1 for the question "Pain right now" had no pain or pain that was easily ignored. Other symptoms included discomfort of the abdominal wall, swollen belly after food intake, back pain and impairment of physical exercise. Patients having VHPQ $>$1 experienced pain that could not be ignored but did not affect daily activity, or worse.

Quality of life was evaluated preoperatively and 3 months postoperatively using a validated health declaration, SF36 (short-form with 36 questions), including an eight-scale profile.[11] The first three domains, physical functioning (PF), physical role functioning (RP) and bodily pain (BP), measure physical well-being. The next two domains, general health (GH) and vitality (VT), measure both