ELSEVIER

Surgery for Obesity and Related Diseases ▮ (2017) 00–00

SURGERY FOR OBESITY AND RELATED DISEASES

Original article

Increased joint pain after massive weight loss: is there an association with joint hypermobility?

Monika Fagevik Olsén, Ph.D., R.P.T.[a,b,*], Sofie Brunnegård, BS.c., R.P.T.[a], Sofia Sjöström, BS.c., R.P.T.[a], Christina Biörserud, Ph.D., R.N.[b], Gunilla Kjellby-Wendt, Ph.D., R.P.T.[a]

[a]*Department of Physical Therapy, Sahlgrenska Academy at Gothenburg University, Gothenburg, Sweden*
[b]*Department of Surgery, Sahlgrenska Academy at Gothenburg University, Gothenburg, Sweden*

Received April 13, 2016; accepted January 6, 2017

Abstract

Background: Obesity is associated with an increased risk of pain in weight-bearing joints. Although pain often decreases after obesity surgery, this is the reverse for some patients. Hypermobility is described as an excessive range of motion in joints and has been suggested to be a possible cause of joint pain. It is not known whether there is an association between increased joint pain after weight loss and hypermobility.

Objectives: The objective of this study was to investigate whether there is an association between hypermobility and increased joint pain after massive weight loss.

Setting: University hospital, Sweden.

Methods: A survey including a screening questionnaire about hypermobility and questions about joint pain was sent to 149 people who had previously undergone bariatric surgery. Ninety-three people (72 women and 21 men) completed the questionnaire.

Results: Nineteen of the respondents fulfilled the criteria for hypermobility. There were no significant differences between the groups with and without hypermobility regarding pain in weight-bearing joints before or after surgery. There was a significant difference between the groups with increased or novel pain in the ankles, shoulders, hands, and feet ($P < .05$) after the weight loss. Furthermore, the patients with hypermobility had increased or novel pain in a significantly higher number of weight-bearing joints, other joints, and joints in total ($P < .05$).

Conclusion: Even with a small sample size, a tendency can be seen for people with hypermobility to experience increased joint pain after weight loss compared with those without hypermobility. (Surg Obes Relat Dis 2017;▮:00–00.)

Keywords: Obesity; Bariatric surgery; Joint instability; Generalized joint laxity; Joint hypermobility syndrome

An increased range of motion in joints, often called hypermobility, is common in the normal population [1–4]. It can be diagnosed as generalized joint hypermobility (GJH) and/or joint hypermobility syndrome (JHS) and plays an important role in musculoskeletal pain. GJH is a relatively common congenital characteristic of the population [1,3,4] and means that the individual has a number of mobile joints. The condition can be determined using different scales. The Beighton scale assesses the degree of joint mobility in 9 joints [1,5,6], and the scale by Hakim and Grahame [6,7] consists of 5 questions concerning the individual's past and current experience of hypermobile joints. The prevalence of GJH in the general population varies between 5% and 30% depending on age, sex, and ethnicity [2,3]. In most cases joint hypermobility has no

*Correspondence: Monika Fagevik Olsén, Ph.D., R.P.T., Department of Physical Therapy, Sahlgrenska University Hospital, 413 45 Gothenburg Sweden.
E-mail: monika.fagevik-olsen@vgregion.se

http://dx.doi.org/10.1016/j.soard.2017.01.018

symptoms and is not a syndrome. It can instead be seen as an asset, at least for acrobats and dancers. Furthermore, hypermobility can be developed, as seen in elite gymnasts and dancers.

JHS, however, is an inherited, systemic, connective tissue disease that involves hypermobility, often in multiple joints, and musculoskeletal pain [8]. It is believed to be caused by excessive movement, which increases the stress on joint surfaces, ligaments, and adjacent structures [9]. The pain can cause muscle weakness, leading to atrophy and impaired proprioception [10]. JHS is also associated with Ehlers-Danlos syndrome [3]. JHS is diagnosed using Brighton criteria, a combination of the Beighton scale and previous and current symptoms and findings during examination [11]. The prevalence in the United States has been found to be 19.5% (women 24.5%, men 13.7%) in the population 17 to 26 years old [2]. It is possible that many people with noninflammatory musculoskeletal disorders may have undiagnosed JHS [12]. The syndrome has been found to be associated with sprains, back pain, and stress fractures [2], which is not the case in people with GJH.

Weight loss after obesity surgery often results in decreased pain in weight-bearing joints. The largest effect is seen in joints in the lower extremities, hips, knees, and ankles but also in the lumbar spine [13,14]. In clinical practice, it has been the authors' experience that patients who describe themselves as having hypermobile joints and who have lost weight after obesity surgery sometimes complain about having more pain after weight loss. To the authors' knowledge there have been no studies evaluating whether there is any association between increased joint pain and joint hypermobility in people who have undergone obesity surgery.

The aim of this study was therefore to investigate whether there is an association between hypermobility and increased joint pain after massive weight loss.

Method

A questionnaire was sent to patients who had participated in a previous study that examined the change in and the degree of excess skin after significant weight loss after obesity surgery [15]. The questionnaires were sent to 149 patients (109 women and 40 men) who participated in the study's follow-up 18 months postoperatively at Sahlgrenska University Hospital, Gothenburg, Sweden [15].

The questionnaire consisted of a Swedish version of the scale by Hakim and Grahame [3,7]. The form contained the following 5 dichotomous questions:

1. Can you now (or could you ever) place your hands flat on the floor without bending your knees?
2. Can you now (or could you ever) bend your thumb to touch your forearm?
3. As a child did you amuse your friends by contorting your body into strange shapes, or could you do the splits?
4. As a child or teenager did your shoulder or kneecap dislocate on more than one occasion?
5. Do you consider yourself double-jointed?

A positive response to 2 or more questions indicated hypermobility [1,6,7]. The form has been tested and found to have high validity [7]. To increase the patients' understanding of the questions, drawings were added to the first 2 questions to describe the movement and a clarifying description was added to the last question.

Besides this questionnaire, additional questions specific for this trial were asked concerning previous or current pain in the following weight-bearing joints: neck, lower back, hips, knees, and ankles, and if patients experienced pain previously, the change in pain since surgery. Change in pain was estimated on a 7-level scale, ranging from "much worse" to "much better." Participants were also asked about the cause of pain and whether they had a diagnosis from a doctor. In addition, to cover all joints, the participants were given a sketch of a body on which they were asked to mark other joints where they experienced decreased or increased pain. They also reported their current weight.

The questionnaire and a postage-paid envelope were sent by mail in August 2015. After one reminder, 93 of the 149 questionnaires were returned, giving a response rate of 62%.

Statistics and ethics

The data collected were analyzed using the programs Microsoft Excel 2010 (Microsoft Corporation, Redmond, W.A.) and SPSS, Version 22 (IBM Corp., Armonk, N.Y.). When analyzing pain in the weight-bearing joints, results from individuals with a diagnosis that was independent of the impact of weight and weight loss (such as whiplash or trauma) were discarded. The questions concerning a difference in pain between before and after surgery were adjusted to worse, similar, and less pain. Only worse pain was used in the analysis for the hypothesis in this article. The markings of pain on the sketch were interpreted as cervical/thoracic spine; shoulders; elbows; hands (intercarpal, metacarpophalangeal, and interphalangeal joints); and feet (tarsal, metatarsal, and phalangeal joints). Markings for hand/fingers and metatarsal/toes were merged to "hands" and "feet," respectively, because of difficulties in distinguishing between the body parts.

Demographic characteristics are presented as mean and standard deviation or number and percentage of individuals. Differences within groups were analyzed using McNemar's test for dichotomous variables. Differences between the groups, with or without hypermobility, were analyzed using the chi-square [2] and Fisher exact tests for dichotomous or categorical variables and the *t* test for continuous variables. The level of significance was defined as $P < .05$.