

The gym ball as a chair for the back pain patient: A two case report

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The popularity of the gym ball has led to its increased use in programs designed for fitness, rehabilitation and prevention. Some people are using the gym ball to replace the office chair and others are sitting on it at home, which has created some controversy among therapists, researchers, ergonomics experts and the general public. The controversy is due in part to a lack of knowledge and experience with this application for the gym ball. Both patients in this report were suffering with low back pain, and both improved when they began consistently using the gym ball. There are two reasons for case presentations, to document a treatment of a condition and to promote discussion that may lead to research. This presentation will hopefully accomplish this.

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KEY WORDS: gym ball, back pain.

Introduction

There has been a considerable increase in the use of the gym ball or Swiss ball as an exercise tool in the last several years.^{1,2,3,4,5} The gym ball is used by trainers in fitness programs and by therapists for injury rehabilitation and prevention. This is due to an improved understanding of spinal stabilization and the role that it plays in back pain. The model put forward by Panjabi, other research-

La popularité du Gymball a débouché sur son utilisation plus fréquente dans les programmes conçus pour le conditionnement physique, la réadaptation et la prévention. Certaines personnes utilisent le Gymball comme chaise tandis que d'autres s'en servent à la maison, ce qui a créé une controverse chez les thérapeutes, les chercheurs, les ergonomes et le grand public. La controverse porte en partie sur l'absence de connaissances et d'expérience en regard des applications du Gymball. Les deux patients traités dans le présent rapport souffraient de douleurs au bas du dos et leur cas s'est amélioré quand ils ont commencé à se servir de manière systématique du Gymball. Nous avons deux raisons de présenter ce cas, de documenter un traitement d'une condition et de susciter une discussion qui pourrait mener à une recherche. Cette présentation devrait permettre d'y parvenir.

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MOTS CLÉS : Gymball, mal de dos.

ers and therapists has promoted a significant increase in the use of the gym ball as a rehabilitation and exercise tool.^{6,7,8,9,10,11,12,13}

One reason for this change is the improvement in our understanding of back pain and the role spinal stabilization plays in this problem.^{8,13} Panjabi has introduced a new approach to spinal stability. He has suggested that

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spinal stability is based on three subsystems; active (muscles), passive (bones), and control (neural).^{6,7} This new information has led to a change in how therapists approach rehabilitation of back pain.

The first use of the gym ball was by Swiss therapists to help improve balance and equilibrium in children with cerebral palsy.^{9,10} Current research demonstrates that the gym ball can be beneficial in influencing muscle function.^{9,10,11,12} Trainers and therapists have observed benefits in their clients and patients. Educators have also suggested that gym balls help students learn better.^{2,14,15} Janda and Va'vrova suggest, "One advantage in using balls is that they are safe, minimize the danger of an injury almost to nil, and help to activate proprioception, balance, and equilibrium control."^{16,17}

With the increase in gym ball use and its rise in popularity, we find that the general public is finding more ways to use the gym ball. Patients and the public will often experiment with things that they find useful or helpful, expanding the use beyond the intended level. In the case of the gym ball, this has led to legitimate concerns and some conflicting information about the safety and appropriate use of the gym ball. These concerns include muscle fatigue and falling off the ball when performing tasks on the ball as a chair, in either the work place or at home.¹⁸

The purpose of the presentation of these two cases is to stimulate discussion and to help alleviate some of the concerns about gym ball use, and to stimulate further research into the uses of the gym ball.

Case One

The first case involves a 55-year-old male with a history of recurring back pain. This patient has been treated for various problems in our office since 1977. The areas of complaint varied from neck, upper back, mid back, low back and various extremities. Most problems were related to occupation and recreation.

His occupation entailed standing for eight hours per day at a counter on the concrete warehouse floor. Much of the time he was lifting or bent over his work. Lifting in the day ranged from lifting light hardware to lifting extremely heavy products. He was employed at this job for approximately 25 years. Minor acute injuries accumulated over the years, and eventually developed into chronic recurring back pain. Over the past several years he has

suffered from constant low-grade backache with recurring bouts of severe back pain.

This patient initially responded well to chiropractic care. However, over the years, his problems became more persistent and severe. The minor injuries began to take longer to heal. A gradual onset of chronic backache developed from occasional to constant, with frequent episodes of severe back pain. The episodes of severe back pain gradually became more frequent and more severe, with the development of occasional leg pain. Chiropractic visits became more frequent, and positive results more difficult to achieve.

Treatment has consisted of chiropractic adjustments, muscle relaxing techniques, exercises and therapy modalities. This proved quite successful until the last four years. At this time, there was a noticeable change, with an increase in visits and a poorer response to treatment. In January of 2002, it was suggested that he begin exercises on the gym ball and try to sit on it for 20 minutes each day. He did this for a short time and quit, because sitting on the ball for this long increased his back pain. His back problems had continued to increase in severity and frequency. X-ray examination 2003/03/20 revealed mild degenerative change at the level of L3-L4 L4-L5 with moderate disc space narrowing at L3-L4.

Re-examination of treatment protocols in the spring of 2005 revealed that he was not using the gym ball because it seemed to irritate his back. He stated that he could only sit on it for two minutes and it began to hurt his back. So he quit using the gym ball. Chiropractic treatment continued, and he was instructed to sit on the ball for 2 minutes or until it was uncomfortable and to increase the time he used the ball, as comfort dictated. At the end of eight weeks he was able to sit on the ball for 20 minutes.

The patient has been rewarded for his persistence with a considerable reduction in all symptoms. He experienced a reduction in the severity and frequency of episodes of back pain, and the sharp back pain and leg pain were completely gone. The constant backache gradually improved and is now not a problem. He now experiences only occasional low back discomfort and no severe back pain or leg pain. Patient office visits have been reduced to once per month or less (Figure 1).

Case Two

The second case involves a 52-year old female office

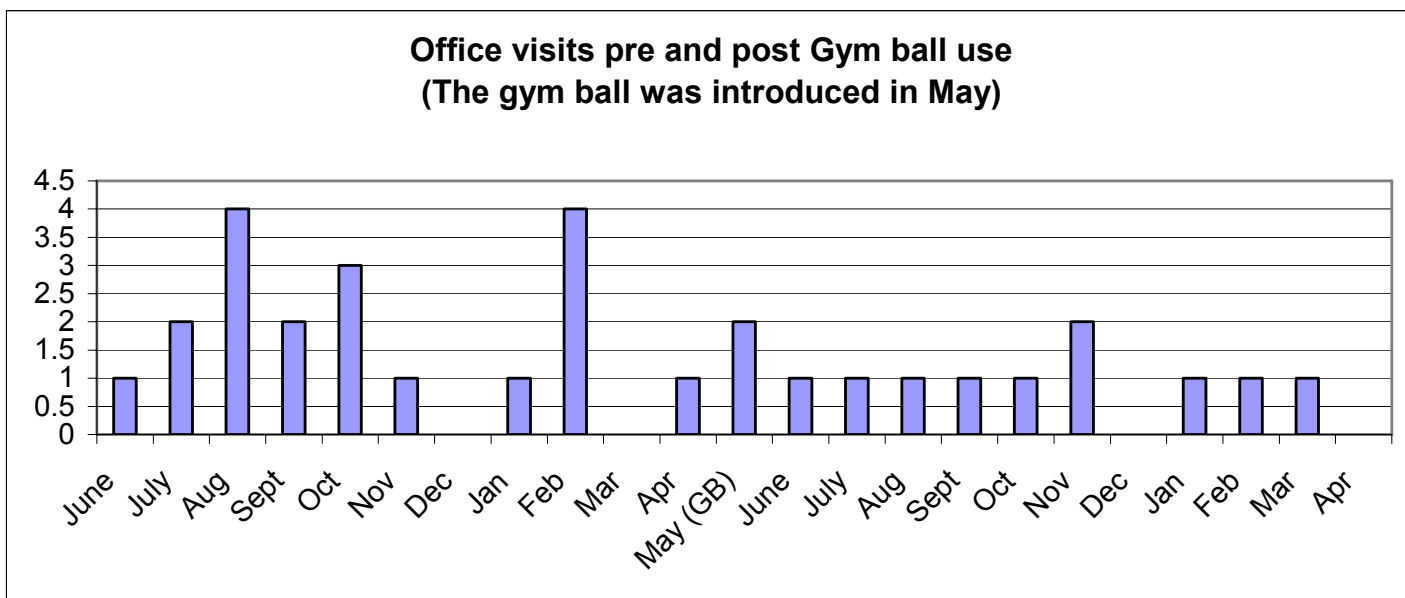


Figure 1 The graph (Figure 1) is a comparison of the number of office visits before and after the gradual reintroduction of the gym ball in May. The graph shows a reduction in the number of office visits after the gym ball was introduced on a regular basis.

worker. Her complaint on the first visit was recurring bouts of severe pain involving her lower back, upper back and neck. She had recently moved to this area and had been seeing another chiropractor to help control this problem. Her previous chiropractor had recommended a gym ball as a chair at work. This had helped reduce the recurrence of back and neck pain, and also seemed to reduce the severity of the episodes of pain as well.

The patient believes that two traumatic incidents are responsible for her back and neck pain. An auto accident in 1998 was the first injury. The second was a severe fall on the ice in 2000. Following these incidents she suffered back and neck pain. Chiropractic care included manipulation and exercise. This helped, but the pain would return after a short period of time. The gym ball was introduced in an attempt to improve the treatment results.

At the time of her first visit to our office, she had been using the ball as a chair at work for about one year and felt that it was helping. She was examined and treated for several joint fixations and advised to continue sitting on the gym ball at work. Over the course of time, gym ball exercises were added to the treatment regime. In the past

four years, her treatment history shows a reduction in patient visits from 17 in 2002 to 4 in 2005.

Due to pressure from within her workplace, the patient has tried to return to a regular office chair on several occasions. Each time there has been an exacerbation of her symptoms, which were relieved by her returning to sitting on the gym ball and more frequent visits to the chiropractor.

For this patient, a combination of chiropractic care, gym ball exercise and the use of a gym ball as a chair at work have contributed to a significant reduction in symptoms of low back pain and reduced frequency of office visits (Figure 2). She has had not only a significant reduction in episodes of back pain but also a reduction in the severity of the episodes.

Discussion

There are several studies that show the benefits of the gym ball. These include increased muscle activation, co-activation and muscle co-contraction.^{6,7,10,11} For the most part, studies have looked at the gym ball for its value in rehabilitation and fitness. These studies have concentrated on

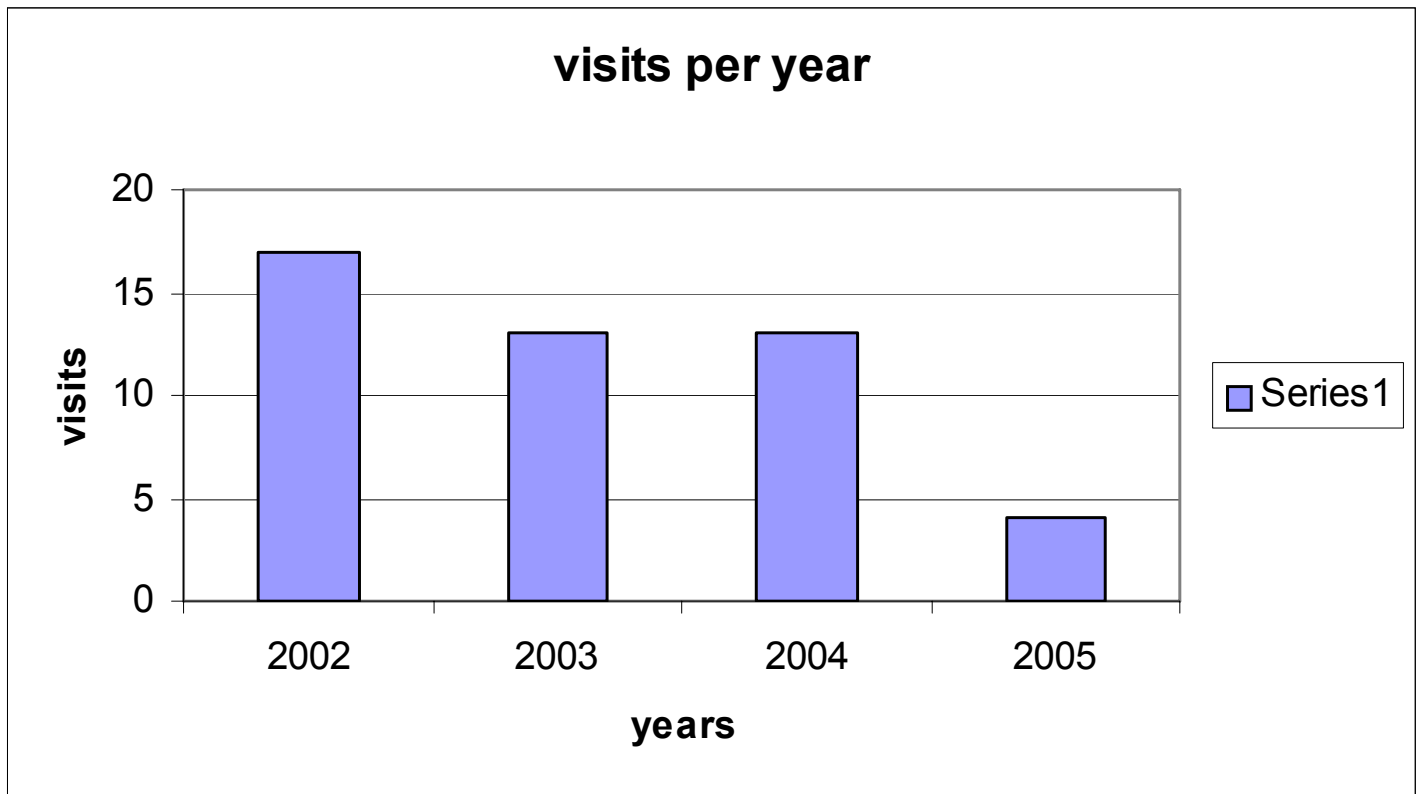


Figure 2

muscle function, muscle strength and muscle coordination.^{9,10,11,19,20,21} Studies of this nature are important to help assess the appropriateness of gym ball use for rehabilitation and fitness. I know of no studies that have identified the muscles that are activated by sitting on the gym ball and few studies, if any, have been done using the gym ball as a replacement for the office chair. A study by Gill and Callaghan found a difference in proprioception between individuals with back pain and those without back pain. This may explain why the gym ball helps the back pain patient.²² Clinical evidence suggests the gym ball may be of benefit for some patients as a replacement for their chair at work. The term for this is “active sitting”.²

The instructions that we use in our clinic for gym ball use are quite simple. The ball must fit the patient. Most authors recommend sitting on the ball with feet flat on the floor and the hips and knees at a 90° angle (figure 3).^{2,4,23} We have been recommending to our patients that the hips should be slightly higher than the knees (1 or 2 inches).

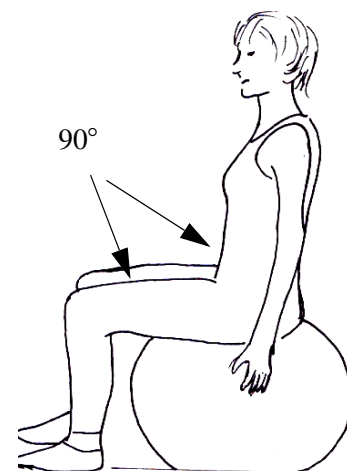


Figure 3

Each patient is instructed to proceed with caution when beginning to use the gym ball and to only sit on it

as long as it is comfortable. We recommend a minimum of 20 minutes on the ball each day for rehabilitation and prevention and it may take time to build up to the 20 minutes. If the ball is to be used as a chair, we recommend a gradual introduction by the patient, sitting only as long as is comfortable. Comfort will determine the amount of time each day that a patient sits on the ball at work. Some patients sit on the ball all day and some for part of the day. Introducing the gym ball as a chair should follow the same guidelines as the introduction of any new exercise plan.

Evidence from our clinic suggests that replacing the office chair with the gym ball can be helpful for some patients.¹⁷ The two cases presented here may help to alleviate some of the concerns that have been expressed by critics of this use for the gym ball.

The first case is of a patient who at first found that sitting on the ball was a painful experience. By having him sit only as long as was comfortable and then as comfort permitted, gradually increasing the time that he spent sitting on the ball, he was able to sit on the ball for 20 to 30 minutes. This gradual introduction of gym ball use into his rehabilitation resulted in a reduction in symptoms and reduced dependence on chiropractic adjustments. We can learn from this case that, as with any change in activity, the gym ball must be introduced gradually, within the individual patient's capacity to accept change.

The second case may help alleviate some of the concerns about use of the gym ball as an office chair. These concerns include: spinal muscle fatigue, lack of back support, no armrests, and the danger of falling off the ball. This patient has used the gym ball as a chair for the past five years with improved symptoms. The lack of armrests and back support has been a non-issue as her back problem has virtually disappeared and she has not fallen off the ball. In our clinic over the past ten years, we have not had any feedback about a patient falling off the ball when using it as a chair. In discussion with colleagues I have not found this to be a problem.

Conclusion

The presentation of these two cases does not supply a definitive answer to the concerns of gym ball use as a chair in the office or at home. It probably raises more questions than it gives answers, but hopefully it will encourage therapists to try this tool in their rehabilitation programs.

By presenting case studies, the field practitioner hopes to stimulate discussion and an exchange of opinions, which hopefully will promote research.

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