The Impact of The Alexander Technique In Improving Posture During Minimally Invasive Surgery

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Introduction

The concept of minimally invasive surgery (MIS) was formally introduced in Germany through the pioneering work of Wittmoser and Semm. Since the inception of MIS these techniques have been rapidly adopted into the surgical repertoire of most surgical subspecialties. To date there has been extensive evaluation of the benefit of MIS procedures to the patient, however the potential adverse impact of MIS on the surgeon and the remainder of the surgical team has only recently been recognized and is now being investigated worldwide.

Surgical ergonomic research is focused on improving the working environment in the operating room. The field of ergonomics was established in 1950, the etymology of ergonomics is from the Greek roots “Ergon” (Labor) and “nomos” (Law). From an ergonomics viewpoint there are five factors that can impact the surgeons ability to perform MIS:
1. Operating table height and patient positioning
2. The position of the monitors
3. The design of the laparoscopic instruments
4. The use of foot pedals to control energy sources
5. The surgeons posture

MIS often requires surgeons and their assistants to maintain awkward, non-neutral and static postures of both the trunk and upper extremities, thereby limiting the natural shifting of posture. Participating in MIS procedures results in relatively high muscle loading on both the axial and appendicular skeleton putting the surgeon at risk for fatigue and injury.

In 1995 Dr. Alfred Cuschieri noted that MIS is more technically demanding, requires greater concentration and is more taxing on the surgeon’s mental energy than conventional open surgery. He coined the term “Surgical Fatigue Syndrome” to describe the incline in surgical performance that occurs over time with MIS.

The Alexander Technique (AT) was developed at the beginning of the 19th century by Frederick M. Alexander (1869-1955). After traditional medical treatments failed to remedy problems with his voice, he began to study his posture. Eventually he cured himself by correcting the positional relationship between his head, neck and spine during activity. Over the past few decades AT has been applied to a variety of neurological and musculoskeletal problems. The scientific basis and the exact manner in which AT brings about its effects are poorly understood, however it can be described as a process of psychophysical re-education of the whole individual, in order to allow movement with minimal strain and maximum ease. AT is based on three principles:
1. Function is affected by use
2. An organism functions as a whole
3. The relationship of the head, neck and spine is vital to the organism’s ability to function correctly.

Essentially AT is a way of achieving core stability without specific muscle strengthening exercises. AT has been found to significantly reduce pain, improve overall functional strength and mobility, modify the stress response, and enhance breathing co-ordination.

Purpose

The purpose of this study is to evaluate the efficacy of the Alexander Technique in improving the surgeons posture and ability during the performance of MIS.

Materials and Methods

We performed a prospective cohort study in which each subject served as their own control. After obtaining IRB approval, a total of seven test subjects (Four Pediatric Urology Fellows and three Urology Residents) were recruited from the Urology training program. Informed consent was obtained from each of the subjects.

All subjects underwent the following:
PreAT-test of basic laparoscopic skill assessment.
PostAT-test of postural co-ordination and load bearing.
PreAT-assessment of posture by an AMSat instructor
PostAT-assessment of posture by an AMSat instructor.

Subjective and objective data was recorded during the PreAT and PostAT assessments. The data was tabulated and analyzed with descriptive statistics and the paired t’ test (GraphPad), to determine if there was significant difference between the PreAT and the PostAT scores.

Results

All subjects demonstrated improved ergonomics and improved ability to complete the laparoscopic skills set in a shorter time. The subjects also reported a subjective improvement in their overall posture. The postural assessment scores of the spine, neck, hand, and fingers all showed statistically significant improvement Post-AT (p values ranging from 0.0198 – 0.0029).

In addition to the scores for the impact on posture, we also noted a significant improvement of the functional and performance assessments.

The scores for the nine peg test were improved Post-AT, we did note a more significant improvement for the non-dominant hand in the test subjects.

The effort perceived to perform the transfer of rings module of the FLS was reduced Post-AT (p = 0.0205).

Conclusion

The AT training program resulted in a significant improvement in posture and trunk & shoulder endurance from PreAT-training to PostAT-training, accompanied by reduction in perceived discomfort when performing the basic laparoscopic skills assessment. Improved endurance and posture reduces the occurrence of surgical fatigue. Intra-operative fatigue has been shown to be associated with surgical errors. AT training has the potential to reduce the occurrence of fatigue related surgical errors. Additionally it may reduce the incidence of repetitive stress injuries that occur amongst surgeons.

Future studies investigating the influence of AT on surgical posture and ergonomics during laparoscopic and open procedures are recommended as this will aid our understanding of the benefits afforded by the AT and allow its implementation into other aspects of surgical training.

We will be undertaking a larger scale cross-specialty assessment of the impact of the AT on surgical ergonomics and posture at our institution.

F. M. Alexander (1869-1955)

The Alexander Technique is a simple and practical method for improving ease and freedom of movement, balance, support, flexibility, and coordination. It enhances performance and is therefore a valuable tool for actors, dancers, and musicians. Practice of the Technique retards the aging process by influencing sensory feedback, offering the performer a control which is fluid and lively rather than rigid. It provides a means whereby the use of a body part is mirrored. Over a career span of more than fifty years, he refined his method of instruction of what has now become known as the Alexander Technique. The effort perceived to perform the transfer of rings module of the FLS was reduced Post-AT (p = 0.0205). The effort perceived to perform the suturing module of the FLS was reduced Post-AT (p = 0.0219).