

# The Impact of the Alexander Technique on Improving Posture and Surgical Ergonomics During Minimally Invasive Surgery: Pilot Study

Pramod P. Reddy,\* Trisha P. Reddy, Jennifer Roig-Francoli, Lois Cone, Bezalel Sivan, W. Robert DeFoor, Krishnanath Gaitonde† and Paul H. Noh

From the Division of Pediatric Urology, Cincinnati Children's Hospital, Xavier University, Department of Radiology, Shriners Hospital and Division of Urology, University of Cincinnati College of Medicine, Cincinnati, Ohio

## Abbreviations and Acronyms

AmSAT = American Society for the Alexander Technique™

AT = Alexander technique

MIS = minimally invasive surgery

postAT = after AT instruction/intervention

preAT = before AT instruction/intervention

Study received institutional review board approval from University of Cincinnati and Cincinnati Children's Hospital Medical Center.

\* Correspondence: Division of Pediatric Urology, Cincinnati Children's Hospital Medical Center (MLC 5037), 3333 Burnet Ave., Cincinnati, Ohio 45229-3039 (telephone: 513-636-7143; FAX: 513-636-6753; e-mail: pramod.reddy@cchmc.org).

† Financial interest and/or other relationship with Intuitive Surgical.

**Purpose:** One of the main ergonomic challenges during surgical procedures is surgeon posture. There have been reports of a high number of work related injuries in laparoscopic surgeons. The Alexander technique is a process of psychophysical reeducation of the body to improve postural balance and coordination, permitting movement with minimal strain and maximum ease. We evaluated the efficacy of the Alexander technique in improving posture and surgical ergonomics during minimally invasive surgery.

**Materials and Methods:** We performed a prospective cohort study in which subjects served as their own controls. Informed consent was obtained. Before Alexander technique instruction/intervention subjects underwent assessment of postural coordination and basic laparoscopic skills. All subjects were educated about the Alexander technique and underwent post-instruction/intervention assessment of posture and laparoscopic skills. Subjective and objective data obtained before and after instruction/intervention were tabulated and analyzed for statistical significance.

**Results:** All 7 subjects completed the study. Subjects showed improved ergonomics and improved ability to complete FLS™ as well as subjective improvement in overall posture.

**Conclusions:** The Alexander technique training program resulted in a significant improvement in posture. Improved surgical ergonomics, endurance and posture decrease surgical fatigue and the incidence of repetitive stress injuries to laparoscopic surgeons. Further studies of the influence of the Alexander technique on surgical posture, minimally invasive surgery ergonomics and open surgical techniques are warranted to explore and validate the benefits for surgeons.

**Key Words:** physicians, laparoscopy, task performance and analysis, mind-body therapies, posture

THE concept of MIS was formally introduced in Germany through the pioneering work of Semm<sup>1</sup> and Wittmoser.<sup>2</sup> After the inception of MIS these techniques were rapidly adopted into the surgical repertoire of most surgical subspecialties. The literature is replete with numerous studies showing the

many irrefutable benefits of these procedures. However, the potential adverse impact of MIS on the surgeon and the rest of the surgical team was only recently recognized and is now being investigated worldwide.<sup>3-5</sup>

In adopting MIS with its current limitations and poor ergonomics MIS

surgeons sustain work related injuries encompassed by a spectrum best described as minimal access surgery related surgeon morbidity syndromes.<sup>6</sup> These syndromes include the overuse syndrome from repetitive stress injuries, surgical fatigue syndrome, and the deterioration of visual acuity and ocular muscle function, resulting in impaired vision. Only through improved understanding of the etiology and underlying ergonomic factors as well as improved instrumentation and operating room ergonomics will we devise short-term and long-term solutions for surgical personnel. From an ergonomics viewpoint 5 factors can impact the surgeon ability to perform MIS, including 1) operating table height and patient position, 2) monitor position and design, 3) laparoscopic instrument design, especially the hand grip, 4) foot pedals to control energy sources, such as diathermy and laser or Waterpik® and 5) surgeon posture.<sup>7</sup>

MIS often requires surgeons and assistants to maintain awkward, nonneutral and static postures of the trunk and upper extremities, limiting the natural shifting of posture. Additional mental effort and stress are imparted to surgical personnel involved in MIS due to the awkward visual and physical interface of video laparoscopic surgery, which increases the surgeon physical work load.<sup>8-13</sup>

In 1995 Cuschieri noted that MIS is more technically demanding, requires greater concentration and is more taxing on surgeon mental energy than conventional open surgery.<sup>3</sup> He coined the term surgical fatigue syndrome to describe the decrease in surgical performance that occurs with time during MIS. Cuschieri sounded the call to arms for ergonomic research aimed at improving the operating environment to decrease surgical personnel physical fatigue and injury.

Frederick M. Alexander (1869 to 1955) developed AT at the beginning of the 20th century.<sup>14</sup> He was a stage actor with recurrent loss of the voice. After traditional medical treatments failed to remedy this ailment he studied his posture at rest and during movement. After many years of self-observation he cured himself by correcting the positional relationship among his head, neck and spine during activity.

Until recently AT has largely been a well kept secret of the performing arts community. In the last few decades AT has been applied to other medical conditions involving various neurological and musculoskeletal problems, ie arthritis, acute and chronic back pain,<sup>15,16</sup> headache, insomnia, depression, asthma<sup>17</sup> and Parkinson's disease.<sup>18,19</sup> AT has even been used to decrease the pain of childbirth.<sup>18</sup> The scientific basis and the exact manner in which AT brings about its effects are poorly understood. It can be described as a process of psychophysical reeducation

of the whole individual to allow movement with minimal strain and maximum ease.<sup>14</sup>

We tested the hypothesis that AT could improve surgical ergonomics and surgeon posture during MIS. In this pilot study we validated the efficiency of AT in enhancing ergonomics in the operating room. The ultimate goal is to provide the surgeon with improved ergonomics during surgical procedures and decreased fatigue, factors that will aid in improving the possible outcomes for patients.

## MATERIALS AND METHODS

The study has 2 specific aims, including to 1) assess the impact of AT on the posture of surgeons performing a standard laparoscopic skill set and 2) determine whether AT improves procedural efficacy and accuracy by improving surgical ergonomics. To address the specific aims, the study was done in the MIS training area at the Division of Pediatric Urology, Cincinnati Children's Hospital Medical Center. Institutional review board approval was obtained and 7 eligible test subjects were recruited from the urological surgery training programs at University of Cincinnati and Cincinnati Children's Hospital Medical Center.

Subjects were given an introductory lecture about AT by AmSAT instructors and informed consent was obtained. Each subject completed a demographic/experience questionnaire including information on handedness at the beginning of the assessment. Subjects then underwent a comprehensive assessment of postural coordination, including a time loading test to test postural endurance.

### PreAT Basic FLS Laparoscopic Skill Assessment

The study subjects completed 4 FLS modules, including bead transfer, ring transfer, suturing and cutting a circle, during which time to completion and accuracy were assessed by an experienced laparoscopic surgeon. Subject posture during FLS was assessed by the AmSAT instructors. At the completion of the skill set subjects completed a self-assessment questionnaire including questions on posture ergonomic quality, breathing patterns and whether any musculoskeletal complaints were experienced as a result of posture during the completion of the FLS modules.

### Planned Intervention

Subjects received a total of 2 group lessons and 6 individual 45-minute sessions with an AmSAT instructor. They were also required to perform a daily 15 to 20-minute semisupine exercise on their own time and were provided with weekend reading assignments about AT. Upon the completion of AT instruction subjects completed a posttest that was a subjective assessment of posture and also documented the amount of laparoscopic surgery performed during the intervention period. AmSAT instructors also examined subject postAT postural coordination.

### PostAT Basic Laparoscopic Skill Assessment

Subjects completed the same FLS module that they had completed as the pretest. Again, time to completion and accuracy were assessed by an experienced laparoscopic surgeon. Subject posture during FLS was assessed by

Download English Version:

<https://daneshyari.com/en/article/3862933>

Download Persian Version:

<https://daneshyari.com/article/3862933>

[Daneshyari.com](https://daneshyari.com)