

USING AN INVERSE METHOD TO OBTAIN THE MATERIAL PARAMETERS OF THE MOONEY-RIVLIN CONSTITUTIVE MODEL FOR PELVIC FLOOR MUSCLES

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Abstract *The group of levator ani muscles (puborectal, pubococcygeus and iliococcygeus muscles) is of the most importance in the active support of the pelvic organs and urethral closure by resisting the downward forces imposed to the organs and to the pelvic floor whenever the intra-abdominal pressure is increased. Deficient muscular contraction, which may be caused by direct neuromuscular damage can result in major defecation disorders or vesico-uterine prolapsed [1].*

For clinical, technical and ethical reasons it is not possible to obtain the properties of these soft tissues in vivo. The utilization of inverse methods is therefore required in order to obtain estimative for the mechanical properties of these structures.

In this work, an optimization algorithm was implemented in order to obtain the optimal mechanical parameters for the Mooney-Rivlin constitutive model [2]. The optimization algorithm uses the python scripting language to couple the Matlab and Abaqus software. The Powell method was used for the optimization part of the algorithm [3].

1. INTRODUCTION

The study of female pelvic floor muscles is important by the prevalence and costs of different