Universität Basel
Department of Biomedical Engineering

Zürcher Hochschule für Angewandte Wissenschaften
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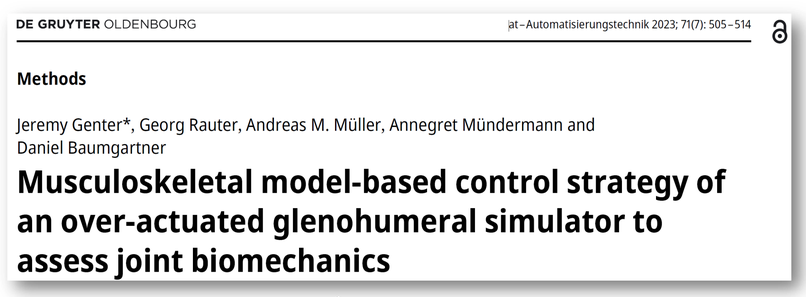
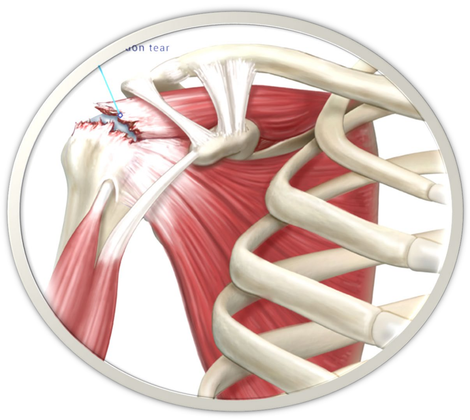
Load-induced changes in glenohumeral translation in patients with rotator cuff tear – simulator-based in situ and ex vivo experiments

Jeremy Genter, Eleonora Croci, Birgit Oberreiter, Franziska Eckers, Dominik Bühler, Georg Rauter, Andreas Marc Müller, Annegret Mündermann, Daniel Baumgartner

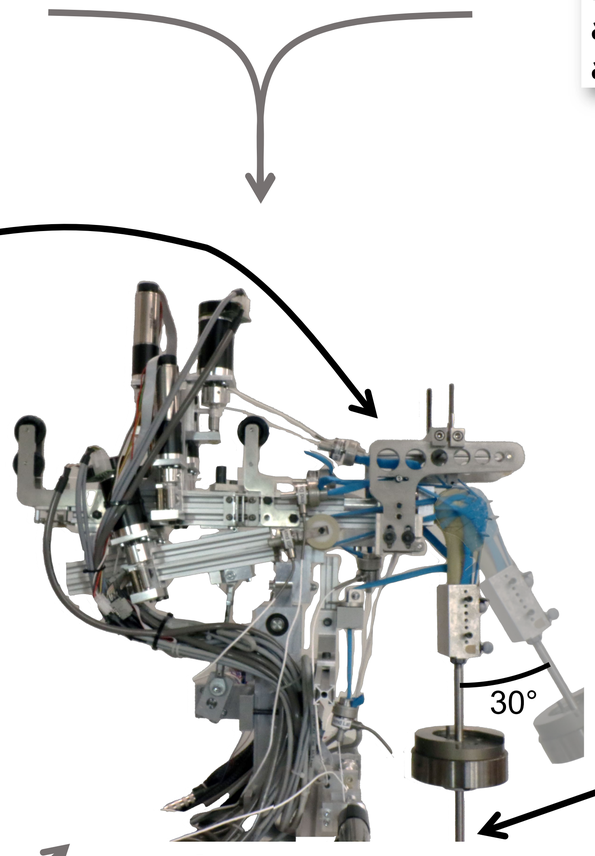
Development of a Glenohumeral Simulator

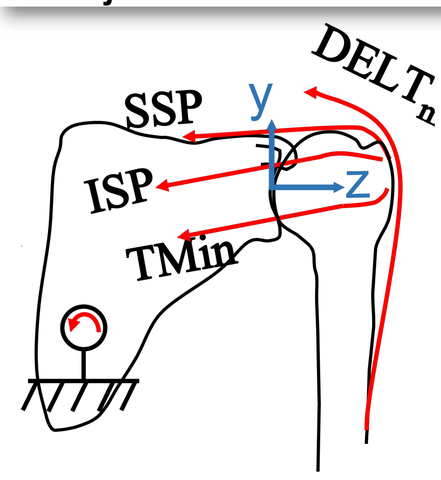


Tear types



Single tear: Subscapularis (SSC), Supraspinatus (SSP), Infraspinatus (ISP)
Multiple tear: SSP+SSC, SSP+ISP, SSP+SSC+ISP



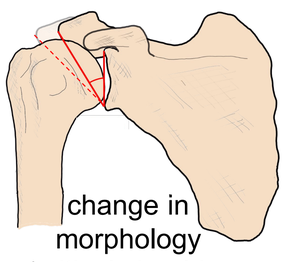


Handheld Weight

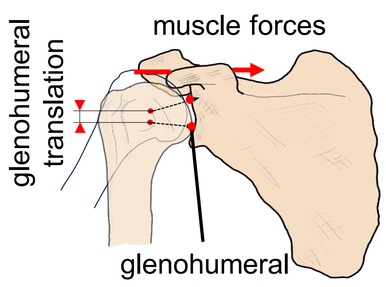
0 kg – 3 kg

Sawbone Experiments [1]

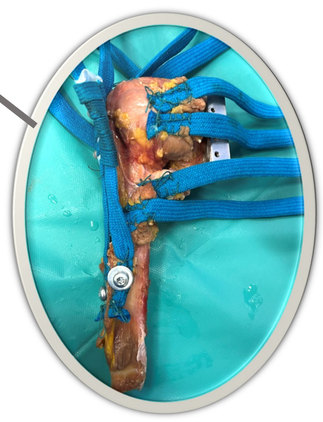
Additional Conditions



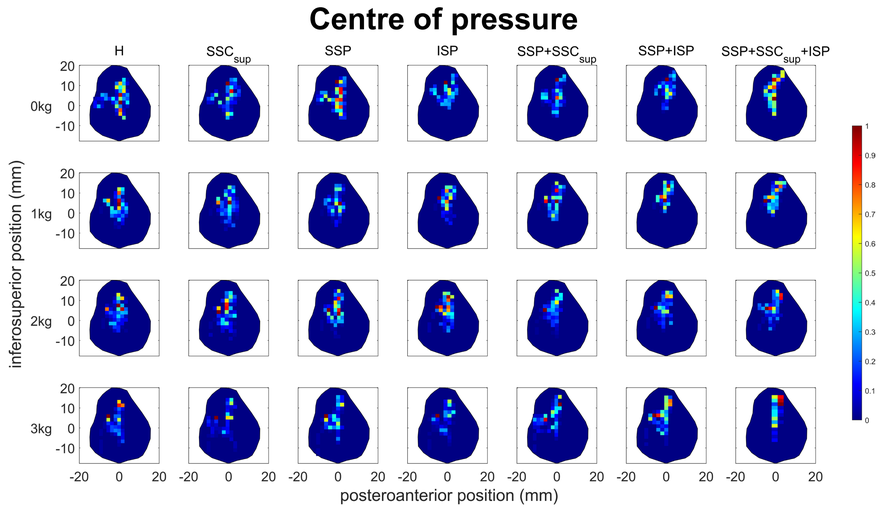
Measurements



Ex vivo Experiments [2]



Centre of pressure



Shoulder Biomechanics

- Load-induced increase in superior glenohumeral translation
- Increase in critical shoulder angle increase glenohumeral translation
- Rotator cuff tears displace the **Center of pressure** superiorly, close to where glenoid erosion occurs in osteoarthritis patients with rotator cuff tears
- Load-induced increase in muscle forces
- Increased muscle forces in rotator cuff tears

Jeremy Genter
jeremy.genter@unibas.ch

Institute for Mechanical Systems, Zurich University of Applied Sciences

Department of Biomedical Engineering, University of Basel

Department of Orthopaedics and Traumatology, University Hospital Basel

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Literature

[1] Genter et al. *J. Orthop. Res.* (in review)

[2] Genter et al. *J Shoulder Elbow Surg.* (in review)