Clinics in Oncology

Editorial
Published: 25 Nov, 2016

Research Interest and Projects

Bassem Elhassan*

Department of Pediatric Cancer, Mayo Clinics, USA

Editorial

Managing complex shoulder disorders as result of brachial plexus injury (obstetric or adult), or significant bone or soft tissue deficiency secondary to injury, advanced degenerative changes or tumor resection could be very challenging. Our work in the lab focuses on evaluating the biomechanics of different types of bony and soft tissue reconstruction to attempt to restore shoulder function in these types of complex shoulder cases.

We have developed over the years several novel tendon transfers in attempt to restore the scapulothoracic and glenohumeral joint motions. In order for the biomechanics to be more accurate, we created a novel state of the art shoulder model that is based on a full hemibody with all muscles and joints remain attached. The hemibody is fixed to a board with multiple holes in it that allow the passage of the numerous cords coming from different muscles of the shoulder area. The cords are created in a way to attempt to replicate the line of pull of the muscles that need to be evaluated around the shoulder. These cords are passed through pulleys and pistons to attempt to mimic normal shoulder muscles function and biomechanics. Joint pressure analysis is also performed.

In patients with trapezius deficiency secondary to nerve injury or muscle injury or muscle resection could lead to significant derangement of the shoulder function secondary to destabilization of the scapulothoracic function. The most commonly described procedures in the literature to manage this problem include the Eden-Lange procedure and scapulothoracic fusion. We leave the scapulothoracic fusion as last resort as salvage procedure. As for Eden-Lange we did evaluate the biomechanics and found it to not replicate the normal scapulothoracic function. This is also reflected by the inconsistent clinical outcome studies reported in the literature. We did come out with a novel transfer we called it the triple transfer that entails independent transfers of the levator scapula, rhomboid minor and rhomboid major to the spine of the scapula to replicate the function of the trapezius. The biomechanics replicate those of normal trapezius and our clinical outcome study did prove it.

For patients with massive posterior-superior rotator cuff, the most commonly described procedure is the latissimus transfer. The outcome also has been variable especially for patients with pseudoparalysis of the shoulder. We came up with a novel transfer, the lower trapezius transfer that also we were able to determine that it is biomechanically better than latissimus transfer. We were able to prove the validity of this transfer clinically as well.

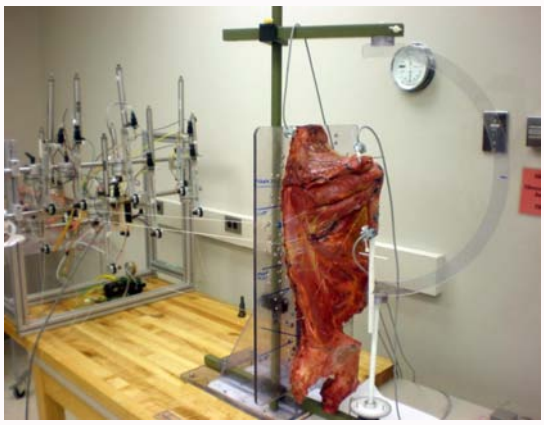

Figure 1: Novel shoulder model with a full hemibody fixed to hard block that has multiple holes, which allow the passage of cords from different muscle parts to pulley and pistons to attempt to replicate the normal shoulder muscle function.

OPEN ACCESS

Correspondence:
Bassem Elhassan, Department of Pediatric Cancer, Mayo Clinics, USA, E-mail: Elhassan.Bassem@mayo.edu

Received Date: *12 Oct 2016*
Accepted Date: *07 Nov 2016*
Published Date: *25 Nov 2016*

Citation:
Elhassan B. Research Interest and Projects. Clin Oncol. 2016; 1: 1144.

For patients with irreparable subscapularis tear or anterior-superior rotator cuff tear, the most commonly described procedure is the pectoralis transfer. However, the results have been disappointing especially if the shoulder is anteriorly subluxated. So we came up with a novel transfer, which is the latissimus transfer anteriorly to the anterior-proximal aspect of the shoulder. Biomechanical comparison between the latissimus transfer and pectoralis transfer showed that the latissimus transfer was significantly better in replicating the biomechanics of the subscapularis tear. Clinical study is on its way but the preliminary studies are very promising.

For patients with obstetric brachial plexus injury, especially for those who present when don't present in the first 5 years, the main procedure described for them to improve their shoulder external rotation is osteotomy of the humerus. Unfortunately, this procedure does not correct any of the significant bony deformities of the shoulder. So, we described a novel procedure that entails corrective osteotomy of the acromion, reconstruction of the glenoid, releasing the contracture of the shoulder and lower trapezius transfer. When we evaluated the new construct biomechanically, it did replicas very closely the shoulder anatomy and mechanics.

In summary, our research studies are focused on the biomechanical evaluation of different types of novel shoulder reconstruction and determine the feasibility of different types of tendon transfers (Figure 1). We also in the process of publishing our clinical outcome studies using different novel types of shoulder reconstructions.