From “MEC '05 Intergrating Prosthetics and Medicine,” Proceedings of the 2005 MyoElectric Controls/Powered Prosthetics Symposium, held in Fredericton, New Brunswick, Canada, August 17-19, 2005.

ASSESSEMENTS, CONCIDERATIONS AND FITTING OF A TRANS HUMERAL HIGH LEVEL BRACHIAL PLEXUS INJURED INDIVIDUAL WITH HO

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This talk will discuss the assessment and prosthetic problems associated with fitting an individual with a mid level Trans Humeral amputation.

TM was a very active healthy 40 yo male, RN Critical care nurse and amateur Triathlete. He does free diving, fishing, canoeing, kayaking and lots of other activities in and outside. He was riding to work one morning on his motorcycle and as a result of someone running a light he ‘t’ boned a car. The result was a fractured femur, dislocated knee, shoulder separation with Brachial plexus avulsion, crushed forearm and slight head injury and retina detachment. He also had several ribs that were broken and a punctured lung.

His hospital stay involved a left mid level Trans Humeral amputation. He also had a rod inserted into the fractured femur. During the course of stay at the hospital he started developing Hyper Ossification of the shoulder, neck, ribs and chest. This HO had encompassed the ribcage and would not allow him to take a deep breath. He was being restricted on his movement even to help get in and out of bed. Approximately 3 months post injury he was discharged with a wheel chair to home. He had contacted our local office to see what could possibly be done prosthetically. He was very disappointed in not being able to do much of anything.

The evaluation included what were his expectations and goals. He would like to do some of his previous activities and would like to have at least some elbow and ‘hand’ grip. Since he was so limited with his upper movement he would like to have an assist to do things around home.
Physical examination revealed he had a severe involvement of HO of the upper torso, neck and left shoulder. The patient brought in a copy of his 3D CT scan. This showed all of the HO involvement along the chest, spine, shoulder and neck. There was a lot of associated pain in and around the shoulder, neck and torso.

Since there was essentially no functional ROM of the humerus and scapula, myoelectric control was the first consideration. The only functional myo sites were from Rhomboids and Trapezius muscles. An SD type prosthesis was fabricated designed to accommodate the remnant humerus with cutouts to allow the humerus to side in during donning and doffing. A shoulder joint and Utah 3 elbow with powered wrist and terminal devices were provided.

Successful operation of the prosthesis was noted early on and the pt was capable of fine control of the system. After approximately 3 weeks, his pain had been ongoing and a visit to his pain specialist resulted in a couple of Botox injections around the medial spine. This resulted in complete loss of the Rhomboid muscle contractions for a period of time. He later had an implantable electric stim to reduce pain. This was suggested to be at a different location as to not interfere with the myo sites

Figure 1 Figure 2

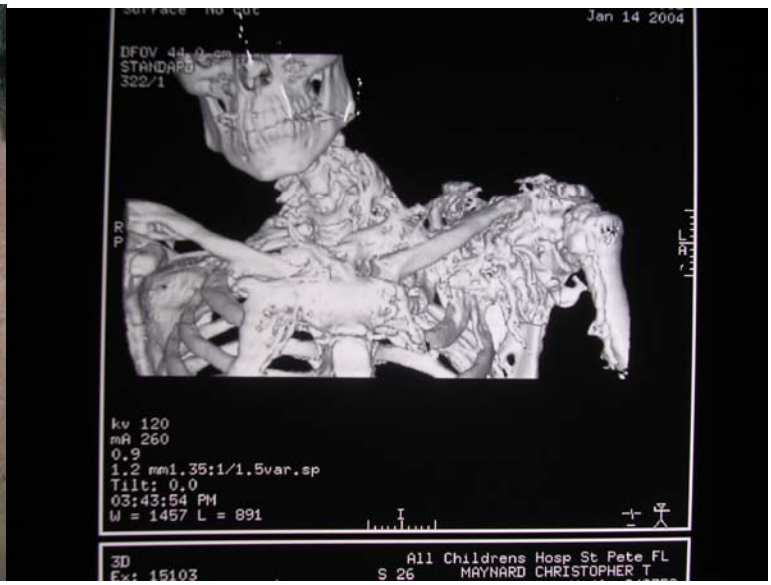

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Figure 3

Figure 4

Figure5

Figure 6

Figure 1 left anterior anatomical view

Figure 2 same view test socket

Figure 4 same view 3D CT scan

Figure 3 left posterior view test socket

Figure 5-6 posterior 3D CT scans