Introduction:
In problematic nerve injuries where primary neurorrhaphy or interposition nerve graft are not feasible, whether nerve transfer or end to side neurorrhaphy (ETSN) are hopeful options. Nerve transfer is done in an end to end fashion, with complete sacrification of the donor nerve and its end organ. Motor nerve transfer is widely used and got many clinical applications especially in brachial plexus and upper limb nerve injuries. ETSN without harming the donor nerve was introduced by Viterbo et al. 1992, this technique attains the interest of many researchers concerned with peripheral nerve surgery. There are still some controversial issues about ETSN, as the ability of both motor and sensory neurons to sprout.

Methods:
Sixty Wister rat weighting 200-300 g were divided into six groups. GI is normal control, GII denervated control where the Cranial tubal muscle (CTM) was denervated by cutting the peroneal nerve, GIII ETSN between the peroneal nerve and side of the tubal nerve (mixed nerve), GIV ETEN of the peroneal nerve (mixed nerve), GV ETSN between motor branch of the lateral head of gastrocnemius muscle (LGCM) and peroneal nerve (mixed nerves), and GVI ETSN between Peroneal nerve (mixed nerve) and motor branch of LGCM (motor nerve). After 60 and 120 (at time of sacrifice) days walking track analysis and peroneal functional index (PFI), EMG, force muscle contraction (FMC), muscle weight, muscle width, and histomorphometry of the nerves and muscles were done. In all the groups the CTM was examined; while LGCM only examined in groups I, III, V and VI to evaluate the effect on the muscle supplied by the donor nerve.

Results:
The four experimental groups were in between the normal control and denervated control. The best was group IV (ETEN with mixed nerve) and the worst was group VI (ETSN with motor nerve). Groups III (ETSN with mixed nerve) and V (ETEN with motor nerve) were so close in all the results, with almost no significant difference in between. In group V the muscle supplied by the donor nerve was completely lost, while in group III the muscle supplied by the donor nerve show no significant difference from the control muscles

Conclusion:
These results give the advantage of ETSN with mixed nerve over the ETEN with motor nerve (nerve transfer), although the evaluation values showed no significant difference, but in ETSN the donor muscle was preserved while in nerve transfer the donor muscle was totally denervated.

References: