

2) Birchall MA, Kingham PJ, Murison PJ, Ayling SM, Burt R, Mitchard L, Jones A, Lear P, Stokes CR, Terenghi G, Bailey M, Macchiarini P. **Laryngeal transplantation in minipigs: vascular, myologic and functional outcomes.** Eur Arch Otorhinolaryngol. 2011 Mar;268(3):405-14. Epub 2010 Sep 15. PubMed PMID: 20842506.

Abstract

There is no effective way of replacing all the functions of the larynx in those requiring laryngectomy. Regenerative medicine offers promise, but cannot presently deliver implants with functioning neuromuscular units. A single well-documented laryngeal transplant in man was a qualified success, but more information is required before clinical trials may be proposed. We studied the early response of the larynx to laryngeal transplantation between 17 pairs of NIH minipigs full matched at the MHC2 locus. Following iterative technical improvements, pigs had good swallowing and a patent airway at 1 week. No significant changes in mucosal blood flux were observed compared with pre-operative measurements. Changes in muscle morphology and fibre phenotype were observed in transplant muscles retrieved after 7 days: the levels of fast and slow myosin heavy chain (MyHC) protein were reduced and embryonic MyHC was up regulated consistent with denervation induced atrophy. At 1 week laryngeal transplantation can result in good swallowing, and is not associated with clinical evidence of ischemia-reperfusion injury in MHC-matched pigs.