Brachial Plexus Neurolysis With Nerve Grafting and Transfer

Gerardo Sanchez-Navarro[1], Walter D Sobba, Victoria Comunale, Rebecca Spenser Nicholas, Andrew E Price, Jacques Henri Hacquebord
[1]Orthopedic Surgery

This video describes brachial plexus exploration and nerve transfer in a pediatric patient with a traction injury to the brachial plexus in whom a neuroma-in-continuity developed. Before incision, the surgical field is prepared with the use of sterile drapes placed as wide as possible to preserve the size of the surgical field. The incision is made 1 cm superior and parallel to the clavicle. Superficial dissection divides the platysma while protecting the supraclavicular nerve branches if possible. Additional dissection with the use of a Colorado-tip Bovie unit and bipolar electrocautery reveals the external jugular vein; the branches are ligated as necessary. Next, the sternocleidomastoid is partially released from the clavicle and retracted medially, allowing for identification of the internal jugular vein. Identification of the anterior scalene allows for protection of the phrenic nerve, which lies on its anterior surface. Next, the C5 nerve root is dissected and appears intact and healthy; however, it enters a large neuroma-in-continuity of the upper trunk of the brachial plexus. Stimulation of the C5 nerve root reveals conduction through the neuroma and contraction of the pectoralis major, biceps brachii, and volar compartment of the forearm. Additional dissection of the brachial plexus allows for identification and protection of the suprascapular nerve, the anterior division of the upper trunk, and the spinal accessory nerve, which lies anteriorly on the undersurface of the trapezius. At this point, a decision is made to perform a nerve transfer from the spinal accessory nerve to the anterior division of the upper trunk with the use of a sural nerve autograft. The sural nerve graft is harvested via an incision 1 cm posterior to the lateral malleolus. Superficial and subcutaneous dissection reveals the nerve, which is cut on tension with the use of a sharp, disposable scalpel. The nerve graft is reversed in polarity and interposed between the distal end of the spinal accessory nerve and the anterior division of the upper trunk. The coaptation is achieved with the use of loosely placed 9-0 nylon sutures and is sealed with the use of fibrin glue. Both incisions are closed in a layered fashion with the use of absorbable suture and are sterilely dressed.