

## Supplementary file 5. Included Studies

	<b>Study title</b>	<b>First author</b>	<b>Year of publication</b>
<b>1</b>	Effectiveness and safety of home-based muscle electrical stimulator in brachial plexus Injury patient	Limthongthang	2014
<b>2</b>	Elbow proprioception sense in total arm -type brachial plexus injured patients after neurotisation: a preliminary study	Homreprasert	2014
<b>3</b>	Comparison between the anterior and posterior approach for transfer of the spinal accessory nerve to the suprascapular nerve in late traumatic brachial plexus injuries	Souza	2014
<b>4</b>	Ultrasound-guided peripheral nerve stimulation for neuropathic pain after brachial plexus injury: two case reports	Kim	2017
<b>5</b>	Contralateral lower trapezius transfer for restoration of shoulder external rotation in traumatic brachial plexus palsy: preliminary report and literature review	Satbhai	2014
<b>6</b>	Restoration of shoulder abduction in brachial plexus avulsion injuries with double neurotization from the spinal accessory nerve: a report of 13 cases	Huan	2017
<b>7</b>	Transfer of the musculocutaneous nerve branch to the brachialis muscle to the triceps for elbow extension: anatomical study and report of five cases	Bertelli	2017
<b>8</b>	Posterior approach for accessory to suprascapular nerve transfer: an electrophysiological outcomes study	Rui	2013
<b>9</b>	Reliability of functioning free muscle transfer and vascularized ulnar nerve grafting for elbow flexion in complete brachial plexus palsy	Potter	2017
<b>10</b>	Management of infraclavicular (Chuang Level IV) brachial plexus injuries: A single surgeon experience with 75 cases	Lam	2015
<b>11</b>	Functioning free muscle transfer for the restoration of elbow flexion in brachial plexus injury patients	Estrella	2016
<b>12</b>	Radial to axillary nerve transfers: A combined case series	Desai	2016
<b>13</b>	Thalamic deep brain stimulation for neuropathic pain after amputation or brachial plexus avulsion	Pereira	2013
<b>14</b>	Nerve transfers for shoulder function for traumatic brachial plexus injuries	Estrella	2014
<b>15</b>	Results of operative treatment of brachial plexus injury resulting from shoulder dislocation: A study with a long-term follow-up	Gutkowska	2017
<b>16</b>	Surgical treatment of brachial plexus posterior cord lesion: A combination of nerve and tendon transfers, about nine patients	Oberlin	2013
<b>17</b>	The medial cord to musculocutaneous (MCMc) nerve transfer: a new method to reanimate elbow flexion after C5-C6-C7-(C8) avulsive injuries of the brachial plexus—technique and results	Ferraresi	2014
<b>18</b>	Transfer of a terminal motor branch nerve to the flexor carpi ulnaris for triceps reinnervation: anatomical study and clinical cases	Bertelli	2015
<b>19</b>	Free functioning gracilis muscle transfer with and without simultaneous intercostal nerve transfer to musculocutaneous nerve for restoration of elbow flexion after traumatic adult brachial pan-plexus injury	Maldonado	2017(a)

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20	Isolated latissimus dorsi transfer to restore shoulder external rotation in adults with brachial plexus injury	Ghosh	2013
21	Functional outcome and quality of life after traumatic total brachial plexus injury treated by nerve transfer or single/double free muscle transfers	Satbhai	2016
22	Successful graded mirror therapy in a patient with chronic deafferentation pain in whom traditional mirror therapy was ineffective: A case report	Mibu	2016
23	Bipolar Transfer of Latissimus Dorsi Myocutaneous Flap for Restoration of Elbow Flexion in Late Traumatic Brachial Plexus Injury: Evaluation of 13 Cases	Azab	2017
24	Comparison of objective muscle strength in C5-C6 and C5-C7 brachial plexus injury patients after double nerve transfer	Tsai	2014
25	Phantom remodeling effect of dorsal root entry zone lesioning in phantom limb pain caused by brachial plexus avulsion	Son	2015
26	Comparison of surgical strategies between proximal nerve graft and/or nerve transfer and distal nerve transfer based on functional restoration of elbow flexion: A retrospective review of 147 patients	Hu	2018
27	Reconstruction of shoulder abduction by multiple nerve fascicle transfer through posterior approach	Ren	2013
28	Intercostal nerve transfer to neurotize the musculocutaneous nerve after traumatic brachial plexus avulsion: A comparison of two, three, and four nerve transfers	Xiao	2014
29	Use of the DEKA Arm for amputees with brachial plexus injury: A case series	Resnik	2017
30	Polyester tape scapulopexy for chronic upper extremity brachial plexus injury	Leechavengvong	2015
31	Contralateral C7 nerve transfer with direct coaptation to restore lower trunk function after traumatic brachial plexus avulsion	Wang	2013
32	Outcome of surgical reconstruction after traumatic total brachial plexus palsy	Dodakundi	2013
33	Bionic reconstruction to restore hand function after brachial plexus injury: a case series of three patients	Aszmann	2015
34	Surgical treatment of the plexus brachialis injury using long-lasting electrostimulation	Tsymbalyuk	2013
35	Phrenic nerve transfer for reconstruction of elbow extension in severe brachial plexus injuries	Flores	2016
36	Direct coaptation of the phrenic nerve with the posterior division of the lower trunk to restore finger and elbow extension function in patients with total brachial plexus injuries	Wang	2016
37	A prospective study comparing single and double fascicular transfer to restore elbow flexion after brachial plexus injury	Martins	2013
38	Chronic post-traumatic neuropathic pain of brachial plexus and upper limb: a new technique of peripheral nerve stimulation	Stevanato	2014

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39	Effectiveness of contralateral C7 nerve root and multiple nerve transfer for treatment of brachial plexus root avulsion	Wei	2014
40	Combined proximal nerve graft and distal nerve transfer for a posterior cord brachial plexus injury	Plate	2013
41	The role of elective amputation in patients with traumatic brachial plexus injury	Maldonado	2016
42	Early microsurgical management of clavicular fracture combined with brachial plexus injury	Liu	2014(a)
43	Contralateral trapezius transfer to restore shoulder external rotation following adult brachial plexus injury	Elhassan	2016
44	Comparative study of phrenic nerve transfers with and without nerve graft for elbow flexion after global brachial plexus injury	Liu	2014
45	Shoulder and elbow recovery at 2 and 11 years following brachial plexus reconstruction	Wang	2016
46	Functional outcomes after treatment of traumatic brachial plexus injuries: clinical study	Aras	2013
47	Free gracilis transfer reinnervated by the nerve to the supinator for the reconstruction of finger and thumb extension in longstanding C7-T1 brachial plexus root avulsion	Soldado	2013
48	Restoration of hand function in C7–T1 brachial plexus palsies using a staged approach with nerve and tendon transfer	Zhang	2014
49	Neurotization to innervate the deltoid and biceps: 3 cases	Dy	2013
50	Arthroscopic arthrodesis of the shoulder in brachial plexus palsy	Lenoir	2017
51	Outcome of contralateral C7 nerve transferring to median nerve	Gao	2013
52	Intercostal nerve transfer to the biceps motor branch in complete traumatic brachial plexus injuries	Cho	2015
53	Tactile feedback for relief of deafferentation pain using virtual reality system: a pilot study	Sano	2016
54	Functioning free gracilis transfer to reconstruct elbow flexion and quality of life in global brachial plexus injured patients	Yang	2016
55	Evaluation of infraspinatus reinnervation and function following spinal accessory nerve to suprascapular nerve transfer in adult traumatic brachial plexus injuries	Baltzer	2017
56	Anatomic study of the intercostal nerve transfer to the suprascapular nerve and a case report	Hu	2014
57	Shoulder abduction and external rotation restoration with nerve transfer	Kostas-Agnantis	2013
58	Contralateral C-7 transfer: is direct repair really superior to grafting?	Bhatia	2017
59	Impact of phrenic nerve paralysis on the surgical outcome of intercostal nerve transfer	Kita	2015
60	Flow-through anastomosis using a T-shaped vascular pedicle for gracilis functioning free muscle transplantation in brachial plexus injury	Hou	2015
61	Free functional muscle transfer tendon insertion secondary advancement procedure to improve elbow flexion	Sechachalam	2017

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62	Dual nerve transfers for restoration of shoulder function after brachial plexus avulsion injury	Chu	2016
63	Cortical plasticity after brachial plexus injury and repair: a resting-state functional MRI study	Bhat	2017
64	Results of spinal accessory to suprascapular nerve transfer in 110 patients with complete palsy of the brachial plexus	Bertelli	2016
65	Magnetic resonance neurographic and clinical long-term results after oberlins transfer for adult brachial plexus injuries	Frueh	2017
66	Free functioning gracilis muscle transfer versus intercostal nerve transfer to musculocutaneous nerve for restoration of elbow flexion after traumatic adult brachial pan-plexus injury	Maldonado	2016
67	Results of wrist extension reconstruction in C5–8 brachial plexus palsy by transferring the pronator quadratus motor branch to the extensor carpi radialis brevis muscle	Bertelli	2016
68	Donor nerve sources in free functional gracilis muscle transfer for elbow flexion in adult brachial plexus injury	Nicoson	2017
69	Use of contralateral spinal accessory nerve for ipsilateral suprascapular neurotization in global brachial plexus injury: a new technique	Bhandari	2016
70	Objective evaluation of elbow flexion strength and fatigability after nerve transfer in adult traumatic brachial plexus injuries	Marcicq	2014
71	Outcomes of muscle brachialis transfer to restore finger flexion in brachial plexus palsy	DeGeorge	2017
72	Functional outcome of nerve transfers for traumatic global brachial plexus avulsion	Liu	2013
73	Transfer of a flexor digitorum superficialis motor branch for wrist extension reconstruction in C5–C8 root injuries of the brachial plexus: a case series	Bertelli	2013
74	Outcome after transfer of intercostal nerves to the nerve of triceps long head in 25 adult patients with total plexus root avulsion injury	Gao	2013
75	Good sensory recovery of the hand in brachial plexus surgery using the intercostobrachial nerve as the donor	Foroni	2017
76	The phrenic nerve as a donor for brachial plexus injuries: is it safe and effective? Case series and literature analysis	Socolovsky	2015
77	Complete avulsion of brachial plexus with associated vascular trauma: Feasibility of reconstruction using the double free muscle technique	Hattori	2013
78	Long-term outcome of brachial plexus re-implantation after complete brachial plexus avulsion injury	Kachramanoglu	2017
79	Force recovery assessment of functioning free muscle transfers using ultrasonography	Kodama	2014
80	Rhomboid nerve transfer to the suprascapular nerve for shoulder reanimation in brachial plexus palsy: A clinical report	Goubier	2016
81	Outcome of contralateral C7 transfer to two recipient nerves in 22 patients with the total brachial plexus avulsion injury	Gao	2013
82	Comparative study of phrenic and intercostal nerve transfers for elbow flexion after global brachial plexus injury	Liu	2015

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<b>83</b>	Donor-side morbidity after contralateral C-7 nerve transfer: results at a minimum of 6 months after surgery	Li	2016
<b>84</b>	Outcome after brachial plexus injury surgery and impact on quality of life	Rasulić	2017
<b>85</b>	Pronator teres branch transfer to the anterior interosseous nerve for treating C8T1 brachial plexus avulsion: An anatomic study and case report	Yang	2014
<b>86</b>	Operative treatment with nerve repair can restore function in patients with traction injuries in the brachial plexus	Stiasny	2015
<b>87</b>	Thoracodorsal nerve transfer for triceps reinnervation in partial brachial plexus injuries	Soldado	2016
<b>88</b>	Co-infusion of autologous adipose tissue derived neuronal differentiated mesenchymal stem cells and bone marrow derived hematopoietic stem cells, a viable therapy for post-traumatic brachial plexus injury: a case report	Thakkar	2014
<b>89</b>	Long-term clinical outcomes of spinal accessory nerve transfer to the suprascapular nerve in patients with brachial plexus palsy	Emamhadi	2016
<b>90</b>	Surgical treatment for total root avulsion type brachial plexus injuries by neurotisation: a prospective comparison study between total and hemicontralateral C7 nerve root transfer	Tu	2014
<b>91</b>	Deactivation of distant pain-related regions induced by 20-day rTMS: a case study of one-week pain relief for long-term intractable deafferentation pain	Qiu	2014
<b>92</b>	End-to-side neurorrhaphy in brachial plexus reconstruction	Haninec	2013
<b>93</b>	Reanimation of elbow extension with medial pectoral nerve transfer in partial injuries to the brachial plexus	Flores	2013
<b>94</b>	Early post-operative results after repair of traumatic brachial plexus palsy	Mohammad-Reda	2013
<b>95</b>	Satisfied patients after shoulder arthrodesis for brachial plexus lesions even after 20 years of follow-up	van der Lingen	2018
<b>96</b>	Posterior branch of the axillary nerve transfer to the lateral triceps branch for restoration of elbow extension: case report	Kilka	2013
<b>97</b>	Clinical analysis of repairing the whole brachial plexus nerve root avulsion by transferring C7 nerve root from the uninjured side	Liu	2014
<b>98</b>	Bipolar transfer of the pectoralis major muscle for restoration of elbow flexion in 29 cases	Cambon-Binder	2018
<b>99</b>	Thoracodorsal nerve transfer for elbow flexion reconstruction in infraclavicular brachial plexus injuries	Soldado	2014
<b>100</b>	Median nerve fascicle transfer versus ulnar nerve fascicle transfer to the biceps motor branch in C5-C6 and C5-C7 brachial plexus injuries: nonrandomised prospective study of 23 consecutive patients	Cho	2014
<b>101</b>	Free functional muscle transplantation of an anomalous femoral adductor with a very large muscle belly: a case report	Kaizawa	2013
<b>102</b>	Selective neurotisation of the radial nerve in the axilla using the intercostal nerve to treat complete brachial plexus palsy	Tuohuti	2016

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<b>103</b>	Objective predictors of functional recovery associated with intercostal nerves transfer for triceps reinnervation in global brachial plexus palsy	Flores	2016
<b>104</b>	Nerve transfer to relieve pain in upper brachial plexus injuries: does it work?	Emamhadi	2017
<b>105</b>	Phrenic nerve transfer versus intercostal nerve transfer for the repair of brachial plexus root avulsion injuries	Abdixbir	2016
<b>106</b>	End-to-side neuroorrhaphy to restore elbow flexion in brachial plexus injury	Limthongthang	2016
<b>107</b>	Chordata method combined with electrotherapy in functional recovery after brachial plexus injury: report of three clinical cases	De Oliveira	2016
<b>108</b>	Clinical outcome following transfer of the supinator motor branch to the posterior interosseous nerve in patients with C7-T1 brachial plexus palsy	Xu	2015
<b>109</b>	Transposition of branches of radial nerve innervating supinator to posterior interosseous nerve for functional reconstruction of finger and thumb extension in 4 patients with middle and lower trunk root avulsion injuries of brachial plexus	Wu	2017
<b>110</b>	Electromyographic findings in gracilis muscle grafts used to augment elbow flexion in traumatic brachial plexopathy	Kazamel	2016
<b>111</b>	Double distal intraneural fascicular nerve transfers for lower brachial plexus injuries	Li	2016
<b>112</b>	Restoration of elbow and hand function in total brachial plexus palsy with intercostal nerves and C5 root neurotisation. Results in 21 patients	Amal	2016
<b>113</b>	The phrenic nerve transfer in the treatment of a septuagenarian with brachial plexus avulsion injury: a case study	Jiang	2018
<b>114</b>	Outcomes of transferring a healthy motor fascicle from the radial nerve to a branch for the triceps to recover elbow extension in partial brachial plexus palsy	Flores	2017
<b>115</b>	Successful nerve transfers for traumatic brachial plexus palsy in a septuagenarian	Johnsen	2016
<b>116</b>	Free functioning gracilis muscle transfer for elbow flexion reconstruction after traumatic brachial pan-plexus injury: Where is the optimal distal tendon attachment for elbow flexion?	Maldonado	2017(b)
<b>117</b>	Results of distal nerve transfers in restoration of shoulder function in C5 and C6 root avulsion injury to the brachial plexus	Bhandari	2017
<b>118</b>	Bipolar dual-lead spinal cord stimulation between two electrodes on the ventral and dorsal sides of the spinal cord: consideration of putative mechanisms	Watanabe	2018
<b>119</b>	Triceps nerve to deltoid nerve transfer after an unsatisfactory intra-plexus neurotisation of the posterior division of the upper trunk	Al-Qattan	2017
<b>120</b>	Trapezius muscle transfer for restoration of elbow extension in a traumatic brachial plexus injury	Alrabai	2018
<b>121</b>	Transfer of the radial nerve branch to the extensor carpi radialis brevis to the anterior interosseous nerve to reconstruct thumb and finger flexion	Bertelli	2015

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<b>122</b>	Ultrasound-guided pulse-dose radiofrequency: treatment of neuropathic pain after brachial plexus lesion and arm vascularisation	Magistrioni	2014
<b>123</b>	Phrenic nerve transfer to the musculocutaneous nerve for the repair of brachial plexus injury: electrophysiological characteristics	Liu	2015
<b>124</b>	Postoperative motor deficits following elbow flexion reanimation by nerve transfer	Hanneur	2018
<b>125</b>	Comparative study of phrenic and partial ulnar nerve transfers for elbow flexion after upper brachial plexus avulsion—a retrospective clinical analysis	Liu	2018
<b>126</b>	Contralateral medial pectoral nerve transfer with free gracilis muscle transfer in old brachial plexus injury	Yavari	2018
<b>127</b>	MEG-BMI to control phantom limb pain	Yanagisawa	2018
<b>128</b>	Complete brachial plexus injury— an amputation dilemma, A case report	Choong	2015
<b>129</b>	Reversal of phantom pain and hand-to-face remapping after brachial plexus avulsion	Tsao	2016
<b>130</b>	A newly developed upper limb single-joint HAL in a patient with elbow flexion reconstruction after traumatic brachial plexus injury: A case report	Kubota	2017
<b>131</b>	Free reverse gracilis muscle combined with steindler flexorplasty for elbow flexion reconstruction after failed primary repair of extended upper-type paralysis of the brachial plexus	Bertelli	2018
<b>132</b>	Multiple nerve and tendon transfers – a new strategy for restoring hand function in a patient with C7-T1 brachial plexus avulsions	Xu	2017
<b>Studies included following updated review May 2021</b>			
<b>133</b>	Outcomes after occupational therapy intervention for traumatic brachial plexus injury: A prospective longitudinal cohort study	Cole	2020
<b>134</b>	Lower trapezius transfer for patients with brachial plexus injury	Crepaldi	2019
<b>135</b>	Bionic upper limb reconstruction: A valuable alternative in global brachial plexus avulsion injuries—a case series	Hruby	2019
<b>136</b>	Transcranial Direct Current Stimulation and mirror therapy for neuropathic pain after brachial plexus avulsion: A randomised double-blind, controlled pilot study	Ferreira	2020
<b>137</b>	A comparative study of two modalities in pain management of patients presenting with chronic brachial neuralgia	Razak	2019
<b>138</b>	Do technical components of microanastomoses influence the functional outcome of free gracilis muscle transfer for elbow flexion in traumatic brachial plexus injury	Martins-Filho	2021

## Supplementary file 5. Included Studies

## References

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