List of contents

List of figuresII
List of tablesVIII
List of abbreviations IX
Aim of the workXI
Chapter 11
Chapter 257
Chapter 366
Chapter 477
Summary and conclusion192
References196
Arabic summary

LIST OF FIGURES

Fig No	Subject	Page
1	The developing embryo during the second gestational month.	5
2	Corticobulbar facial nerve fibers projecting through the internal capsule.	11
3	Facial nerve projections within the pons	15
4	Diagram of facial nerve anatomy.	17
5	Relationship of the facial nerve to the cochlear and vestibular nerves	22
6	Intratemporal course of the facial nerve.	23
7	The course and relationships of the left facial nerve from the pontomedullary	25
8	Overview of the facial nerve in its intratemporal course.	26
9	The facial nerve and its relationships.	27
10	Axial view of the middle ear and epitympanum	30
11	Major areas of bony dehiscence of the facial nerve.	36

12	Anomalous course of the facial nerve through the crura of the	37
	stapes.	
13	Bifurcation of the facial nerve about the crura of the stapes.	38
14	Posterior lateral displacement of the facial nerve at the second	38
	genu.	
15	The sketch demonstrates tripartition of the facial nerve distal to the second Genu.	39
16	Occasionally a large vein accompanies the facial nerve in the	42
	fallopian canal.	
17	Schematic drawing of a neuron.	43
18	Cross-section schematic of nerve demonstrating endoneurium,	44
	perineurium, and epineurium.	
19	Myelinated axon demonstrating saltatory conduction.	48
20	Sunderland classification of peripheral nerve injury.	50
21	Sunderland's classification of neural injury.	51
22	The horizontal and vertical portions of the facial nerve via	80
	transmastoid approach. The canal wall has been left up.	
23	The horizontal and vertical portions of the facial nerve via	81
	transmastoid approach. The canal wall has been taken down.	
24	Skin incision for a combined middle fossa/transmastoid	83
	exploration of the facial nerve.	
25	The combined middle fossa/transmastoid approach. Two bony	83
	openings are required.	

26	The operative view of the middle fossa approach with detail	85
	of the structures inside of the temporal bone.	
27	Exposure of the internal auditory canal via the middle fossa	
	approach.	
28	Exposure of the labyrinthine and horizontal segments of the	87
	facial nerve via the middle fossa approach.	
29	Repair of facial nerve injuries via the middle fossa approach.	88
30	The translabyrinthine approach.	90
31	Anatomy of the cerebellopontine angle as viewed through a	93
	large retrosigmoid craniectomy.	
32	Retrosigmoid approach.	
33	A patient with long-standing left facial paralysis is depicted.	99
34	Superior eyelid crease incision is performed allowing the	102
	suturing of a gold weight onto the upper eyelid tarsal plate.	
35	The simple technique for a temporary lateral tarsorrhaphy.	103
36	Lateral tarsal strip for lower lid malposition.	105
37	Brow lifting is performed by the placement of a surgical pin in	106
	the calvarium and securing of a permanent suture to the pin.	
38	External nasal valve repair via fascia lata sling from alar base	107
	to zygoma.	
39	Lower lip wedge resection assists with lower lip competence.	111

40	Figure shows proper placement of suture through trimmed epineurium.	116
41	Facial nerve is rerouted in translabyrinthine approach to gain approximately 1.5 cm of length.	117
42	Facial nerve rerouting and reanastamosis using the translabyrinthine approach.	118
43	Anterior rerouting of the facial nerve.	122
44	Posterior rerouting of the facial nerve.	125
45	The two most commonly used nerves for nerve grafting: the greater auricular nerve (<i>above</i>) and the sural nerve (<i>below</i>).	126
46	The great auricular nerve is located halfway between the mastoid tip and angle of the Mandible.	127
47	Exposure of the greater auricular nerve.	128
48	sural nerve. The small saphenous vein runs along with the nerve.	130
49	Location of sural nerve, posterior to lateral malleolus and follows course of lesser saphenous vein.	130
50	Facial nerve jump graft in the cerebellopontine angle and internal auditory canal segments.	133
51	Hypoglossal facial nerve transfer. Hypoglossal nerve is shown in green, facial nerve in orange.	138
52	Lazy S standard parotidectomy incision is used in this procedure.	139
53	Parotid gland is mobilized anteriorly and superiorly as sternocleidomastoid muscle is retracted posteriorly	141

54	Proximal end of hypoglossal nerve is anastomosed to distal	143
	end of facial nerve.	
55	Modification with 40% segment of nerve secured to lower	
	division.	
56	End-to-side nerve coaptation . Lateral lesion on the donor	148
	nerve.	
57	End-to-side nerve coaptation . Neurorrhaphy without injury to	149
	the donor nerve.	
58	Reflection of the facial nerve out of the mastoid bone to meet	150
	the hypoglossal nerve in the neck.	
59	Translocation of intratemporal facial nerve with direct	151
	anastomosis	
60	Jump graft (purple) modification.	152
61	In CN XII/VII jump graft, greater auricular or sural nerve	154
	graft is harvested.	
62	Placement of a cross face nerve graft.	157
63	Collagen tubules may be used as adjunct to coaptation of	160
	jump graft and facial nerve or hypoglossal nerve.	
64	A 4 cm wide segment (about two fingerbreadths) of the	165
	midportion of the muscle is outlined with the cautery.	
65	A heavy periosteal elevator is used to elevate the muscle off	166
	the squamous portion of the temporal bone.	
66	A 2-0 polypropylene (Prolene) suture is placed through each	168
	pedicle in a figure-eight, and the needle is left on the suture.	
67	Large clamps are used to pull the needles with sutures and	169
	attached muscle pedicles through the subcutaneous tunnel.	

68	The pedicles of the temporalis muscle are sutured to facial muscle.	170
69	Securing the transposed Temporalis muscle to the orbicularis oris.	172
70	Note the overcorrection of the commissure so that the first molar is visible.	173
71	The corner of the mouth is pulled toward the angle between the two pedicles.	174
72	After muscle inset, the temporoparietal fascial flap is placed into the donor site defect.	175
73	Transfer of the anterior belly of the digastric.	177
74	Harvest of gracilis muscle from the medial thigh.	183
75	Inset of gracilis muscle in the paralyzed side of the face with vascular anastomosis to the facial artery	184

LIST OF TABLES

Table No	Subject	Page
1	Differential Diagnoses of Unilateral Facial Palsy in a Review of Medical Literature (1900-1990) .	60
2	Etiologies Associated with Bilateral Facial Palsies (may be concurrent or delayed).	61
3	House-Brackmann Nerve Grading System.	69
4	Topodiagnostic tests.	70
5	Comparison of NET and MST (NET, nerve excitability test; MST, maximum stimulation test.).	72

List of Abbreviations

AP	Action Potential
CAP	Compound Action Potential
CMP	Compound Muscle Action Potential
CN III	Occulomotor Nerve
CN VII	Facial Nerve
CPA	Cerebellopontine Angle
CSF	Cerebrospinal Fluid
CSOM	Chronic Suppurative Otitis Media
CT	Computed Tomography
EMG	Electromyography
ENOG	Electronenronography
ETS	End – to – Side
FGF	Fibroblast Growth Factor
FIG	Figure
GDNF	Glial Derived Neurotrophic Factor
GG	Geniculate Ganglion
GSAs	General Sersory Afferents
GSPN	greater SuperFicial Petrosal Nerve

GVE	General Visceral Efferent
IAC	Internal Auditory Canal
LVs	Lentiviral Vectors
MCF	Middle Cranial Fossa
MRI	Magnetic Resonance Imaging
MST	maximal Stimulation Test
NCs	Nerve Conduits
NET	Minimum Nerve Excitability Test
NGF	Nerve Growth Factor
NMSCs	Neural induced Mesenchymal Stem Cells
NSC	Neural Stem Cell
NSCs	Neural Stem Cells
PGA	Polyglycolic Acid
PLGA	Ploglycolic / Poly glycolic Acid
SCs	Stem Cells
SVA	Special Visceral Afferent

Aim of the work

The aim of this essay is to study the recent advances used in the facial nerve reconstruction.