

Contents

Foreword	xvi
Preface	xviii
Contributors	xix
Part 1 General Concepts	
1 Perioperative Management and Considerations	2
<i>Bettina Föhre and Susanne König</i>	
1.1 Physiology	2
1.1.1 Basic Physiology of Cerebral Blood Flow ..	2
1.1.2 What Is Different in Patients with Moyamoya Disease?	2
1.2 Anesthesia	2
1.2.1 Choice of Anesthesia Technique	2
1.2.2 Preoperative Evaluation and Premedication	3
1.2.3 Monitoring	4
1.2.4 Targets of Anesthesia	4
1.2.5 Induction and Maintenance	5
1.2.6 Emergence	5
1.3 Postoperative Care for Moyamoya Disease Patients	6
1.3.1 Where?	6
1.3.2 Pain Control	6
1.4 Threats of Anesthesia for Moyamoya Disease Surgery	7
1.4.1 Ischemic Stroke and Transient Ischemic Attacks	7
1.4.2 Cerebral Hyperperfusion Syndrome.....	7
References	7
Suggested Readings	7
2 General Principles of Direct Bypass Surgery	8
<i>Marcus Czabanka and Peter Vajkoczy</i>	
2.1 History and Initial Description	8
2.2 Analysis of Hemodynamic Compromise for Direct Bypass Surgery	8
2.3 Key Principles of Direct Revascularization Surgery	9
2.3.1 Graft Choice	9
2.3.2 Recipient Artery	10
2.3.3 Standardized Strategies versus Targeted Bypass Procedures.	10
2.3.4 Peri- and Intraoperative Management and Neuroprotection	11
2.3.5 Intraoperative Flow Assessment.....	11
2.4 General Complications and Risk Stratification	11
References	12
3 General Principles of Indirect Bypass Surgery	14
<i>Satoshi Kuroda</i>	
3.1 Introduction	14
3.2 History and Initial Description	14
3.3 Pathophysiology	14
3.4 Concept of Indirect Bypass Surgery	15
References	16

Part 2 Indirect Revascularization

4	Multiple Burr Holes	20		
	<i>Thomas Blauwblomme, Philippe Meyer, and Christian Sainte-Rose</i>			
4.1	History and Initial Description	20	4.7	Pitfalls, Risk Assessment, and Complications
4.2	Indications	20		21
4.3	Key Principles	20	4.8	Special Instructions, Position, and Anesthesia
4.4	SWOT Analysis	20		21
4.4.1	Strengths	20	4.8.1	Anesthesia
4.4.2	Weakness	21	4.8.2	Position
4.4.3	Opportunities	21		22
4.4.4	Threats	21	4.9	Skin Incision and Key Surgical Steps ...
4.5	Contraindications	21	4.10	Difficulties Encountered
4.6	Special Considerations	21		23
4.6.1	Imaging	21	4.11	Bailout, Rescue, and Salvage Maneuvers
4.6.2	Patient	21	4.12	Tips, Pearls, and Lessons Learned
				23
				References
				24
5	Encephalo-myo-synangiosis	25		
	<i>Nils Hecht and Peter Vajkoczy</i>			
5.1	History and Initial Description	25	5.9.1	Patient Position and Skin Incision
5.2	Indications	25	5.9.2	Pterional Skin Incision
5.3	Key Principles	25	5.9.3	Separate Skin and Muscle Flaps
5.4	SWOT Analysis	26	5.9.4	Mobilization of the Temporalis Muscle ...
5.4.1	Strengths	26	5.9.5	Elevation of the Muscle Flap
5.4.2	Weaknesses	26	5.9.6	Craniotomy and Drilling of the Sphenoid Wing
5.4.3	Opportunities	26		28
5.4.4	Threats	26	5.9.7	Opening of the Dura and Encephalo-duro-synangiosis
5.5	Contraindications	26	5.9.8	Suturing of the Muscle Fascia to the Edge of the Dural Opening
5.6	Special Considerations	26	5.9.9	Bone Flap Reimplantation
5.7	Pitfalls, Risk Assessment, and Complications	26		29
5.8	Special Instructions, Position, and Anesthesia	27	5.10	Difficulties Encountered
5.9	Key Surgical Steps	27		29
			5.11	Bailout, Rescue, and Salvage Maneuvers
			5.12	Tips, Pearls, and Lessons Learned
				31
				References
				31

6	Encephalo-duro-arterio-syngangiosis: Pediatric	32		
	<i>Edward Smith</i>			
6.1	History and Initial Description	32	6.7	Pitfalls, Risk Assessment, and Complications
6.2	Indications	32		34
6.3	Key Principles	32	6.8	Special Instructions, Position, and Anesthesia
6.4	SWOT Analysis	33		34
6.4.1	Strengths	33	6.9	Patient Position with Skin Incision and Key Surgical Steps
6.4.2	Weaknesses	33		34
6.4.3	Opportunities	33	6.10	Difficulties Encountered
6.4.4	Threats	33		38
6.5	Contraindications	33	6.11	Bailout, Rescue, and Salvage Maneuvers
6.5.1	General Contraindications to Revascularization Surgery	33		38
6.5.2	Specific Contraindications to EDAS	33	6.12	Tips, Pearls, and Lessons Learned
6.6	Special Considerations	33		39
7	Encephalo-duro-arterio-syngangiosis: In Adults	40		Suggested Readings
	<i>Hao Jiang, Michael Schiraldi, and Nestor R. Gonzalez</i>			39
7.1	History and Initial Description	40	7.8	Preoperative Workup
7.1.1	Literature Support for the Use of EDAS in Adults	40		45
7.2	Indications	40	7.8.1	Specific Consideration with Anticoagulation
7.3	Key Principles for the EDAS Surgery in Adults	43		45
7.4	SWOT Analysis	43	7.9	Patient Preparation
7.4.1	Strengths	43		45
7.4.2	Weaknesses	43	7.9.1	Patient Position with Skin Incision
7.4.3	Opportunities	43		45
7.4.4	Threats	44	7.10	Surgical Steps
7.5	Specific Adult EDAS Contraindications	44		46
7.5.1	Absolute	44	7.10.1	STA Dissection
7.5.2	Relative	44		46
7.5.3	Not Contraindications	44	7.10.2	STA Care and Preservation
7.6	Special Considerations	44		47
7.6.1	Care Beyond the Surgical Field	44	7.10.3	Craniotomy
7.7	Risk Assessment and Complications ...	45		47
			7.10.4	Middle Meningeal Artery Preservation ...
				47
			7.10.5	Cerebrospinal Fluid Release
				47
			7.10.6	Dural Flaps Preparation and Superficial Temporal Artery Fixation
				47
			7.10.7	Craniotomy Closure
				47
			7.11	Difficulties Encountered and Pearls of Management
				50
			7.12	Pitfalls
				50
			7.13	Bailout, Rescue, and Salvage Maneuvers
				50
			7.14	Postoperative Care
				50

7.14.1	Patient Surveillance	50	7.14.4	Advanced Imaging.....	50
7.14.2	EDAS Functional Assessment.....	50			
7.14.3	EDAS Angiographic Assessment	50		References.....	50

8 Bifrontal Encephalo-duro-periosteal-synangiosis Combined with STA–MCA Bypass..... 52

Giuseppe Esposito, Annick Kronenburg, Jorn Fierstra, Kees P.J. Braun, Catharina J.M. Klijn, Albert van der Zwan, and Luca Regli

8.1	History and Initial Description	52	8.9	Patient Position with Skin Incision and Key Surgical Steps.....	54
8.2	Indications	53			
8.3	Key Principles.....	53	8.9.1	Direct (STA–MCA) and Indirect (EDMS) Bypass for Unilateral MCA Territory Revascularization	54
8.4	SWOT Analysis.....	53	8.9.2	Bifrontal EDPS	56
8.5	Contraindications.....	54	8.10	Difficulties Encountered	57
8.6	Special Considerations	54	8.11	Bailout, Rescue, and Salvage Manoeuvres	57
8.7	Complications	54	8.12	Tips, Pearls, and Lessons Learned	57
8.8	Special Instructions and Anesthesia ...	54		References.....	57

Part 3 Direct Revascularization

9 STA–MCA Bypass for Direct Revascularization in Moyamoya Disease..... 60

Alessandro Narducci and Peter Vajkoczy

9.1	History and Initial Description	60	9.8	Special Instructions, Position, and Anesthesia	62
9.2	Indications	60			
9.3	Key Principles.....	61	9.9	Patient Position with Skin Incision and Key Surgical Steps.....	62
9.4	SWOT Analysis.....	61	9.9.1	Preparation.....	62
9.4.1	Strengths	61	9.9.2	Surgical Technique	62
9.4.2	Weaknesses	61	9.10	Difficulties Encountered	66
9.4.3	Opportunities.....	61	9.11	Bailout, Rescue, and Salvage Maneuvers	66
9.4.4	Threats	61	9.12	Tips, Pearls, and Lessons Learned	67
9.5	Contraindications.....	61	9.12.1	Preoperative Evaluations	67
9.6	Special Considerations	61	9.12.2	Technical Tips	67
9.6.1	Preoperative Imaging	61	9.12.3	Postoperative Care	67
9.6.2	Anticoagulation.....	61		References.....	67
9.6.3	Other Considerations	61			
9.7	Pitfalls, Risk Assessment, and Complications	61			

10	Double-Barrel Bypass in Moyamoya Disease	68		
	<i>John E. Wanebo and Robert F. Spetzler</i>			
10.1	History and Initial Description	68	10.9	Skin Incision and Key Surgical Steps ...
10.2	Indications	68	10.9.1	Skin Incision and Dissection of STA
10.3	Key Principles of the Double-Barrel Bypass	69	10.9.2	Temporal Muscle Dissection and Craniotomy.
10.4	SWOT Analysis	69	10.9.3	Dural Opening
10.4.1	Strengths	69	10.9.4	Anastomotic Site Selection.
10.4.2	Weaknesses	69	10.9.5	Donor STA Preparation.
10.4.3	Opportunity	69	10.9.6	Recipient MCA Branch Preparation
10.4.4	Threats	69	10.9.7	MCA Arteriotomy
10.5	Contraindications	69	10.9.8	Anastomosis
10.6	Special Considerations	69	10.9.9	Graded Release of the Temporary Clips and Hemostasis
10.7	Risk Assessment and Complications ...	69	10.9.10	Second Anastomoses
10.8	Special Instructions, Position, and Anesthesia	69	10.9.11	Closure Phase
10.8.1	Preoperative Workup	69	10.9.12	Postoperative Care
10.8.2	Patient Position	70	10.10	Difficulties Encountered
10.8.3	Anesthesia	70	10.11	Bailout, Rescue, and Salvage Maneuvers
11	Occipital Artery–Middle Cerebral Artery Bypass in Moyamoya Disease	77	10.12	Tips, Pearls, and Lessons Learned
	<i>Ken Kazumata</i>			References
11.1	History and Initial Description	77		
11.2	Indications	77	11.7	Pitfalls, Risk Assessment, and Complications
11.3	Key Principles	77	11.8	Special Instructions, Position, and Anesthesia
11.4	SWOT Analysis	77	11.9	Patient Position with Skin Incision and Key Surgical Steps
11.4.1	Strengths	77	11.10	Difficulties Encountered
11.4.2	Weaknesses	77	11.11	Bailout, Rescue, and Salvage Maneuvers
11.4.3	Opportunities	77	11.12	Tips, Pearls, and Lessons Learned
11.4.4	Threats	77		References
11.5	Contraindications	77		
11.6	Special Considerations	78		
12	STA–ACA/MCA Double Bypasses with Long Grafts	80		
	<i>Akitsugu Kawashima</i>			
12.1	History and Initial Description	80	12.2	Indications

12.3	Key Principle of STA–ACA/MCA Double Bypasses with Long Grafts	80	12.8	Special Instructions, Position, and Anesthesia	81
12.4	SWOT Analysis	80	12.9	Patient Position with Skin Incision and Key Surgical Steps	82
12.4.1	Strength	80	12.10	Difficulties Encountered	83
12.4.2	Weaknesses	80	12.11	Bailout, Rescue, and Salvage Maneuvers	83
12.4.3	Opportunity	81	12.12	Tips, Pearls, and Lessons Learned	84
12.4.4	Threats	81	12.12.1	Graft Management	84
12.5	Contraindications	81	12.12.2	Anastomosis	84
12.6	Special Considerations	81	12.12.3	Training	84
12.7	Pitfalls, Risk Assessment, and Complications	81		Suggested Readings	84
13	Double Anastomosis Using Only One Branch of the Superficial Temporal Artery: Single-Vessel Double Anastomosis	85			
	<i>Ziad A. Hage, Gregory D. Arnone, and Fady T. Charbel</i>				
13.1	History and Initial Description	85	13.7	Pitfalls, Risk Assessment, and Complications	87
13.2	Indications	85	13.8	Special Instructions, Position, and Anesthesia	87
13.3	Key Principles	85	13.9	Skin Incision and Key Surgical Steps ...	88
13.4	SWOT Analysis	86	13.10	Difficulties Encountered	91
13.4.1	Strengths	86	13.11	Bailout, Rescue, and Salvage Maneuvers	91
13.4.2	Weaknesses	86	13.12	Tips, Pearls, and Lessons Learned	91
13.4.3	Opportunities	86		References	92
13.4.4	Threats	86		Suggested Readings	92
13.5	Contraindications	86			
13.6	Special Considerations	87			

Part 4 Combined Revascularization

14	Combined STA–MCA Bypass and Encephalo-myo-synangiosis	94
	<i>Marcus Czabanka and Peter Vajkoczy</i>	
14.1	History and Initial Description	94
14.2	Indications	94
14.3	Key Principles	94
14.4	SWOT Analysis	94
14.4.1	Strengths	94
14.4.2	Weaknesses	95
14.4.3	Opportunities	95
14.4.4	Threats	95
14.5	Contraindications	95
14.6	Special Considerations	95

14.7	Pitfalls, Risk Assessment, and Complications	96	14.11	Bailout, Rescue, and Salvage Maneuvers	99
14.8	Special Instructions, Position, and Anesthesia	96	14.12	Tips, Pearls, and Lessons learned	99
14.9	Patient Position and Key Surgical Steps	97		References	99
14.10	Difficulties Encountered	98			
15	STA–MCA Bypass and EMS/EDMS	100			
	<i>Ken Kazumata and Kiyohiro Houkin</i>				
15.1	History and Initial Description	100	15.7	Pitfalls, Risk Assessment, and Complications	102
15.2	Indications	100	15.8	Special Instructions, Position, and Anesthesia	102
15.3	Key Principles	100	15.9	Patient Position with Skin Incision and Key Surgical Steps	103
15.4	SWOT Analysis	100	15.10	Difficulties Encountered	103
15.4.1	Strengths	100	15.11	Bailout, Rescue, and Salvage Maneuvers	103
15.4.2	Weaknesses	100	15.12	Tips, Pearls, and Lessons Learned	103
15.4.3	Opportunities	100		References	105
15.4.4	Threats	100			
15.5	Contraindications	100			
15.6	Special Considerations	100			
16	Combined Direct (STA–MCA) and Indirect (EDAS) EC–IC Bypass	106			
	<i>Erez Nossek, Annick Kronenburg, and David J. Langer</i>				
16.1	History and Initial Description	106	16.8	Special Instructions, Position, and Anesthesia	108
16.2	Indications	106	16.9	Patient Position with Skin Incision and Key Surgical Steps	108
16.3	Key Principles	107	16.9.1	Description of the Technique	108
16.4	SWOT Analysis	107	16.10	Difficulties Encountered	111
16.5	Contraindications	107	16.11	Bailout, Rescue, and Salvage Maneuvers	115
16.6	Special Considerations	107	16.12	Tips, Pearls, and Lessons Learned	115
16.6.1	Preoperative Considerations	107		References	115
16.6.2	Postoperative Considerations	107			
16.7	Pitfalls, Risk Assessment, and Complications	108			

17	STA–MCA Anastomosis and EDMAPS	116		
	<i>Satoshi Kuroda</i>			
17.1	History and Initial Description	116	17.8	Patient Position with Skin Incision and Key Surgical Steps.
				119
17.1.1	STA–MCA Anastomosis and EDMAPS as an “Ultimate” Bypass	116	17.8.1	Skin Incision and Donor Tissue Preparation.
				119
17.2	Indications and Contraindications	116	17.8.2	Craniotomy and Dural Opening.
				119
17.2.1	Asymptomatic Moyamoya Disease.	118	17.8.3	Direct STA–MCA Anastomosis.
				120
17.2.2	Ischemic-Type Moyamoya Disease	118	17.8.4	Indirect Bypass and Cranioplasty
				122
17.2.3	Hemorrhagic-Type Moyamoya Disease ...	118	17.9	Difficulties Encountered
				122
17.3	Key Principles.	119	17.9.1	Preservation of Scalp Blood Flow
				122
17.4	SWOT Analysis.	119	17.9.2	Preservation of the MMA during Craniotomy.
				123
17.5	Special Considerations	119	17.9.3	ICG Videoangiography before Craniotomy
				124
17.6	Pitfalls, Risk Assessment, and Complications	119	17.9.4	STA–MCA Anastomosis
				125
17.7	Special Instructions and Anesthesia ...	119	17.10	Bailout, Rescue, and Salvage Maneuvers
				125
				References.
				125
18	STA–MCA Bypass and Encephalo-duro-arterio-synangiosis.	126		
	<i>Sepideh Amin-Hanjani</i>			
18.1	History and Initial Description	126	18.9.3	Craniotomy.
				129
18.2	Indications	126	18.9.4	Recipient Vessel Preparation
				129
18.3	Key Principles.	127	18.9.5	Donor Vessel Preparation.
				130
18.4	SWOT Analysis.	127	18.9.6	STA–MCA Bypass.
				130
18.4.1	Strengths	127	18.9.7	Encephalo-arterio-synangiosis
				131
18.4.2	Weaknesses	127	18.9.8	Encephalo-duro-synangiosis.
				131
18.4.3	Opportunity	127	18.9.9	Closure
				131
18.4.4	Threat	127	18.10	Difficulties Encountered
				133
18.5	Contraindications	127	18.10.1	Donor Vessel
				133
18.6	Special Considerations	127	18.10.2	Craniotomy/Durotomy
				133
18.7	Pitfalls, Risk Assessment, and Complications	128	18.10.3	Recipient Vessel.
				133
18.8	Special Instructions, Position, and Anesthesia	128	18.10.4	Anastomosis.
				133
18.9	Patient Position with Skin Incision and Key Surgical Steps.	128	18.10.5	Closure
				133
18.9.1	Position.	128	18.11	Bailout, Rescue, and Salvage Maneuvers
				133
18.9.2	Skin Incision and STA Harvest.	128	18.12	Tips, Pearls, and Lessons Learned
				134
			18.12.1	Preoperative Management.
				134
			18.12.2	Intraoperative Anesthetic Management ..
				134
			18.12.3	Intraoperative Technique.
				134
			References.	135

19	Individualized Extracranial-Intracranial Revascularization in the Treatment of Late-Stage Moyamoya Disease.....	136
	<i>Bin Xu</i>	
19.1	History and Initial Description	136
19.2	Indications	136
19.3	Key Principles.....	136
19.4	SWOT Analysis.....	136
19.4.1	Strength	136
19.4.2	Weaknesses	136
19.4.3	Opportunities.....	136
19.4.4	Threats	136
19.5	Contraindications	137
19.6	Special Considerations	137
19.7	Pitfalls, Risk Assessment, and Complications	138
19.8	Special Instructions, Position, and Anesthesia	139
19.9	Patient Position with Skin Incision and Key Surgical Steps.....	140
19.9.1	Skin Incision.....	140
19.9.2	Temporal Muscle.....	140
19.9.3	Bone Flap	140
19.9.4	Dura Mater	140
19.9.5	Target Revascularization	144
19.9.6	The Simplest Anastomosis Techniques.	146
19.10	Difficulties Encountered	148
19.11	Bailout, Rescue, and Salvage Maneuvers	148
19.12	Tips, Pearls, and Lessons Learned	148
	Suggested Readings	149

Part 5 Rescue Strategies for Repeat Surgery

20	Omental–Cranial Transposition.....	152
	<i>Mario Teo, Jeremiah N. Johnson, and Gary K. Steinberg</i>	
20.1	Background	152
20.1.1	History	152
20.2	Indications	152
20.3	Key Principles.....	152
20.4	SWOT Analysis.....	152
20.4.1	Strength	152
20.4.2	Weakness	152
20.4.3	Opportunity.....	152
20.4.4	Threat	152
20.5	Contraindications	153
20.6	Special Considerations	153
20.7	Risk Assessment: Our Experience	153
20.8	Preoperative Workup	153
20.8.1	Specific Consideration with Anticoagulation.....	153
20.9	Patient Preparation	153
20.9.1	Patient Position with Skin Incision.....	153
20.10	Surgical Steps.....	154
20.10.1	Key Procedural Step 1: Omental Harvest..	154
20.10.2	Key Procedural Step 2: Delivery and Tunneling	154
20.10.3	Key Procedural Step 3: Craniotomy	154
20.11	Tips, Pearls, and Lessons Learned	154
20.12	Pitfalls	154
20.13	Bailout, Rescue, and Salvage Maneuvers	156
20.14	Postoperative Care.....	156
20.14.1	Patient Surveillance	156

20.14.2	Bypass Function Assessment	158	20.15.2	Case 2	158
20.15	Case Illustrations.	158	20.16	Conclusion	158
20.15.1	Case 1	158		Suggested Readings	160
21	ECA–MCA Bypass with Radial Artery Graft	161			
	<i>Satoshi Hori and Peter Vajkoczy</i>				
21.1	History and Initial Description	161	21.7	Pitfalls, Risk Assessment, and Complications	162
21.2	Indications	161	21.8	Special Instructions, Position, and Anesthesia	162
21.3	Key Principles.	161	21.9	Patient Position with Skin Incision and Key Surgical Steps.	162
21.4	SWOT Analysis.	162	21.10	Difficulties Encountered	165
21.4.1	Strength	162	21.11	Bailout, Rescue, and Salvage Maneuvers	165
21.4.2	Weaknesses	162	21.12	Tips, Pearls, and Lessons Learned	165
21.4.3	Opportunity	162		References.	167
21.4.4	Threat	162			
21.5	Contraindications	162			
21.6	Special Considerations	162			
22	OA–MCA or OA–PCA Bypass	168			
	<i>Mario Teo, Jeremiah N. Johnson, and Gary K. Steinberg</i>				
22.1	Background	168	22.8.1	Specific Consideration with Anticoagulation	169
22.1.1	History	168	22.9	Patient Preparation	169
22.2	Indication	168	22.9.1	Patient Position with Skin Incision	169
22.3	Key Principles.	168	22.10	Surgical Steps.	169
22.4	SWOT Analysis.	168	22.10.1	Key Procedural Step 1: OA Harvest	169
22.4.1	Strength	168	22.10.2	Key Procedural Step 2: Craniotomy and Dural Opening	171
22.4.2	Weakness	168	22.10.3	Key Procedural Step 3: Prepare Recipient Vessel	171
22.4.3	Opportunity	168	22.10.4	Key Procedural Step 4: Prepare Donor Vessel	171
22.4.4	Threat	168	22.10.5	Key Procedural Step 5: Microanastomosis	171
22.5	Contraindications	168	22.10.6	Key Procedural Step 6: Ensure Bypass Graft Patency	171
22.5.1	Relative Contraindications	169	22.10.7	Key Procedural Step 7: Closure	174
22.6	Special Considerations	169	22.11	Tips, Pearls, and Lessons Learned	174
22.7	Risk Assessment—Stanford Experience	169	22.12	Pitfalls	174
22.8	Preoperative Workup	169			

22.13	Bailout, Rescue, and Salvage Maneuvers	174	22.15.1	Case 1: OA–PCA Bypass	174
			22.15.2	Case 2: OA–MCA Bypass	177
22.14	Postoperative Care	174	22.16	Conclusion	177
22.14.1	Patient Surveillance	174		Suggested Readings	177
22.14.2	Bypass Function Assessment	174			
22.15	Case Illustrations	174			
23	PAA–MCA Bypass	178			
	<i>Menno R. Germans and Luca Regli</i>				
23.1	History and Initial Description	178	23.7	Pitfalls, Risk Assessment, and Complications	180
23.2	Indications	179	23.8	Special Instructions, Position, and Anesthesia	180
23.3	Key Principles	179	23.9	Patient Position with Skin Incision and Key Surgical Steps	180
23.4	SWOT Analysis	179	23.10	Difficulties Encountered	181
23.4.1	Strengths	179	23.11	Bailout, Rescue, and Salvage Maneuvers	181
23.4.2	Weakness	179	23.12	Tips, Pearls, and Lessons Learned	181
23.4.3	Opportunity	179		References	181
23.4.4	Threat	179			
23.5	Contraindications	179			
23.6	Special Considerations	180			
	Index	182			