Index

Note: Page numbers in italics refer to Figures; those in bold to Tables

alloplastic reconstruction
  custom prosthesis
    conjunction with orthognathic surgery, 181
    craniofacial deformity, 181
    orthognathic and TMJ prosthetic reconstruction, 187–200
    surgical planning see surgical planning
    wax-up of custom prosthesis, 184, 187
stock prosthesis
  advantages and disadvantages, 157
  alloplastic materials, 147
  autogenous joint replacement, 145
  bilateral ankylosis, 169, 170
  Biomet stock prosthesis, 150–152, 160, 161
  Christensen stock prosthesis, 148–50, 154, 158
  class I occlusion, restoration, 170
  complications, 166
  condylar prostheses, 147, 147
  and custom alloplastic devices, comparison, 162
  diamond rasp, 165, 166
  3D reconstruction, 173
  endotec prosthesis, 159
  FDA-approved implants, 145, 169
  fossa and ramus prostheses, placement, 178
  hemiarthroplasty, 155, 168
  history, 146, 148
  ideal screw placement, 165
  indications, 145
  Kent-Vitek fossa, 150, 152
  large condylar mass, 173
  Lefort osteotomy, 177
  osteochondroma, 172, 173, 174
osteotomy, 178
  “plastic on metal” design, 159
  potential interference evaluation, 177
  preoperative planning, 157, 159
  “pseudo-translation,” demonstration, 161
  psoriatic arthritis, 176
  Rasp overlying fossa, 160
  reconstruction plate, 147, 148
  “swan-neck” cervical deformity, 156, 162
  two-step osteotomy, 163, 163–4
ankylosis, 3
  bilateral, 16, 169, 170, 185
  bone scan, 27
  bony, 98, 126
  costochondral graft, 136–7
  eminoplastic, 94
  heterotopic bone formation, 243
  imaging, 16, 27
  intubation, 241
  oral hygiene, mastication and speech, 241
  problems, 241
  trismus and TMJ, 199–200
  type-I Christensen prosthesis, 242
arthritis
  psoriatic, 176
  rheumatoid see rheumatoid arthritis
  septic see septic arthritis
  unilateral, 177
arthrography
  ankylosis, pediatric patient, 13
  bilateral degenerative joint disease, 12
  “bird beaking” TMJ and condylar sclerosis, 12
  bone windows, CT, 14
  complications, 11
arthrography (cont’d)
condyle, osteoarthritis, 14
facial asymmetry, 14
“hoof” deformity, condylar head, 13
osteoarthritis, 13
videotaped arthrofluoroscopic study, 11
auricular cartilage
disk replacement, 78
graft harvesting, 79
post-meniscectomy, temporalis fascia graft, 81
temporalis muscle, myofascial or facial flap, 79, 80
autogenous reconstruction
advantages and disadvantages, 131
costochondral graft, 131–8
distraction osteogenesis, 139, 142–3
vascularized (fibula) graft, 138–9
Biomet Microfixation TMJ Replacement System®, 237
Biomet stock prosthesis
chrome–cobalt condylar prosthesis, 151
condylar component, 162
fossa prosthesis, 160, 161
intermaxillary fixation, 151
metal-on-x plastic design, 150
microfixation, 195
place ment, 161
total joint system, 160
bone remodeling in children, 115, 129, 129
bone scans
ankylosis, 27
anterior joint space effusion, 27
radionucleotide imaging, 26, 27, 28
technetium-labeled phosphate complexes, 26
chondrosarcomas
malignant tumors, 228–9
mesenchymal, 228
synovial chondromatosis, 228
Christensen stock prosthesis
all-metallic version, 154, 158, 159
cobalt–chromium alloy fossa implant, 148–50
natural condyle, 149
type-I Christensen prosthesis
condylar, 149, 154, 157
fractured condylar head, 239
heterotopic bone formation, 242
posterior—anterior skull, 241
type-II—Christensen prosthesis
condylar, 149, 154, 155, 156
flattened condylar head, 240
Christensen TMJ Prosthesis System®, 237
complications
ankylosis see ankylosis
condylar fractures, 235–7
hemorrhage, 233–4
HTBF, 234
infection, 234–5
materials failure see materials failure
nerve injury see nerve injury
computed tomography (CT)
3D reconstruction and computer planning
ankylosis, 16
bilateral condylar resorption, 18
bilateral sagittal fractures, condylar heads, 15
comminuted fracture, ramus and subcondylar region, 17
condylar displacement, 16
condylar head fracture, pediatric patient, 15
dislocated condyle, 16
maxilla and mandible repositioned, 18
septic arthritis, 17
three-dimensional CT images, 19
temporomandibular region, imaging, 111–12, 114
condylar diskopexey see diskopexey
condylar fractures, 3
bilateral, 109
in children
degree of fracture displacement, 129
detection, 123
follow-up program, 130
incidence, 123
physical and radiographic examination, 126
head fracture, 15, 110, 111
condylar hyperplasia, 27, 28, 213, 214, 224–5
condylectomy
bone-holding forceps, 98
condyle sectioning, 100
Dunn-Dautrey retractors, 99–100, 96
extensive posttraumatic bony ankylosis, 98
fissure bur, 97
modified posterior mandibular incision, 99
osteotomies sequence, 99
prosthesis/costochondral graft, 99
retromandibular incision, 100
spring-loaded bell exerciser, 99
standard endaural approach, 99, 96
T-bar osteotome, 100, 97
condyloplasty, 57, 63, 85, 86
condylotomy
advantages, 103
chronic TMJ pain, 103
condyle ramus complex, 101
disadvantages, 103
intraoral coronoidectomy, 102
modified, 82
proximal segment, 103
ward, 100–102
coronoidectomy, 102, 159, 167
costocondral graft
ankylosis, 136
complications, 138
“double stacked,” 136
endaural incision, 134, 135
function and adaptation, 137
in glenoid fossa, 137
harvested costochondral graft, 136
hemifacial microsomia, 135
heterotopic bone formation, 131–2
hyaline cartilage, 133, 134–5
intermaxillary fixation, 134
multiple fragments, 134
in pediatric patients, 131
with perichondrium intact, 133
placement, 132
resection of osteochondroma, 138
retromandibular incision, 135
ribs, harvesting, 132, 132–3, 133, 136
custom cutting guides, 193
decision making, 1–4
Delrin-Timesh condylar prosthesis, 147, 151
dermal graft, 78
desmoplastic fibroma, 219
disectomy see meniscectomy
diskopexy
description, 71
displaced disk deformation, 74
meniscal repositioning, 72
Mitek anchoring system, 71, 73
nonresorbable suture, 72
stage III and stage IV internal
 derangements, 71
disk plication
description, 69
disk repositioning, posterior attachment, 70
eminoplasty, chronic open lock
treatment, 70
modified right-angle vascular clamps, 69
repositioned meniscus, 69
distraction osteogenesis
advances in multidirectional distractors and
CT planning, 142
advantages, 139
challenges and complications, 139
device placement, 143
Dunn-Dautrey retractors, 96, 99–100, 164
eminoplasty
articular eminence, medial extent, 91
bone file, 86
bony perforations and status post, 92
condylar head and glenoid fossa cryosection, 87
CT and MRI, 85, 94
Dautrey procedure, articular eminence, 95
dislocation, 87, 88
glenoid fossa with eminence reduced, 89
high condylar shave, 86
hypermobility treatment, 85
inadvertent ankylosis, 94
lateral cortical, 91
mandible, unobstructed condylar motion, 93
middle cranial fossa, proximity, 90
osteotomy, 89, 90
persistent dislocation, emergency room
 intervention, 93
rasp, 92
subluxation, 85
endaural incision
description, 39–40
placement, 38, 39
vs. preauricular approach, 44
retraction, skin flap, 43
well-healed, 48, 52
exophytic osteoma, 217
extra-abdominal desmoid, 219
extraoral technique, 121
extraoral vertical ramus osteotomy, 214
facial nerve
frontal and zygomatic branches, 43, 232
galvanic stimulation, 33
main trunk identification, 33
normal condyle and fossa, mandible closed, 32
permanent nerve damage, 33
postsurgical palsy, 33
from stylomastoid foramen, 32
temporal branch, 31, 38, 42, 47, 223, 231
fibromatosis, aggressive
description, 219
diagnosis, 220
fixation techniques, 121
intermaxillary fixation, Risdon wire, 128
methods, 117–23
rigid fixation, 115–16, 118
skeletal fixation, nasal spine wire, 127
foreign body reactions
clinical and radiographic examinations, 225
displaced condyle, 226
exophytic preauricular mass, 228
irregular spicule of bone, 227
osteogenic sarcoma, 227
palpable exophytic mass, 226
proplast (polytetraflouroethylene), 225
Teflon-proplast implant, 225

foreign body reactions
clinical and radiographic examinations, 225
displaced condyle, 226
exophytic preauricular mass, 228
irregular spicule of bone, 227
osteogenic sarcoma, 227
palpable exophytic mass, 226
proplast (polytetraflouroethylene), 225
Teflon-proplast implant, 225

giant cell tumor
axial and coronal condyle, 218
postresection, 219
surgical specimen, 218
glenoid fossa
costochondral graft, 137
cryosection, 87
fracture, 124
middle cranial fossa fenestration, 187
Goldenhar syndrome, 205
“green stick” fractures, 108, 126

hemarthrosis, 108
hemiarthroplasty or partial joint reconstruction, 149, 155, 168, 242
heterotopic bone formation (HTBF), 82, 155, 166, 183, 234, 242, 243
“hoof” deformity, 13, 206
hypermobility, 4, 85

imaging
arthrography, 11, 12–14
bone scans, 26–8
computer tomography (CT), 14–19
magnetic resonance imaging (MRI), 19–26
orthopantogram, 5–6
plain film radiography, 5, 7, 113
tomograms, 5–11

internal derangements, surgery, 2
anteriorly displaced disk without reduction, 65
antero-medially displaced disk and tissue forces, 68
articular eminence, 62
#15 blade, 57–9
Cadaver specimen, condyle and dissected disk, 63
capsule extent, 58
condyle in open position, 68
condyloplasty, 63, 66
direct trauma prevention, 63
diskopexy see diskopexy
disk plication see disk plication
disk position evaluation, 59
endaural approach, 66
incision into inferior joint space, 60
joint capsule incision and superior joint space, 59
lateral pterygoid with fat plane separation, 62
meniscal salvage procedures, 57
meniscectomy see meniscectomy
meniscoplasty, 68, 70
modified condylostomy, 82
MRI, 20
open joint procedures, 57
physiologic position, meniscus, 67
postoperative care, 82, 82, 83
reciprocal clicking, 64
repair/meniscectomy, disk isolation, 60
superior joint space, 62
TMJ capsule, 59
T1 MRI closed and open positions, 64, 65
Wilks classification, 58
Wilks retractor, 61, 66
intracapsular fracture, 111

jaw exercise physical therapy, 129

Kent-Vitek Prosthesis (VK-I)
bilaminate glenoid fossa implant, 237
mandibular component, 152
ramus prosthesis, 153
removal, 152
synthes reconstruction plate, 150
total joint prosthesis, 152

K-wire, 118, 121
lag-screw-washer technique, 118, 119, 123
Lefort osteotomy, 175, 176
Lefort I osteotomy, 198

magnetic resonance imaging (MRI)
anteriorly displaced disk, 21, 23, 24, 25
closed mouth T1 MRI, left TMJ, 22
condyle disk position, 20, 21
degenerative condylar changes and meniscus thinning, 25
degenerative joint disease, 26
disk and capsule attachments, 26
disk displacement, 20
ferromagnetic clips, 19
lateral disk herniation, 26
retrodiscal tissue thickening, 23
T1 and T2 weighted images, 19
temporomandibular region, 111–12, 114
mandibular condyle fractures
classification
anatomic location and condylar fragment, 112, 115
type I fracture (nondisplaced), 115
type II fracture (fracture deviation), 115
type III fracture (fracture displacement), 115
type IV fracture (fracture dislocation), 115
signs and symptoms, 109–10
treatment
alternative shaped plates, 119
bone remodeling in children, 115
bony ankylosis, 126
in children, 123–30, 127
closed treatment, 116
condylar fractures, 125
displaced condylar head, 124, 128
extraoral technique, 121
fixation techniques, 121
glenoid fossa, fracture, 124
intermaxillary fixation, Risdon wire, 128
internal fixation, 115
jaw exercise physical therapy, 129
lag screw technique, 123
“lambda” plate, 120
methods of fixation, 117–23
open reduction, 116, 116–17
rigid fixation, 115–16, 118
skeletal fixation, nasal spine wire, 127
“square” plate configuration, 118, 119
stabilizing condylar fractures, 118
subcondylar fracture, 120, 122
materials failure
Dacron-reinforced silicone sheet, 238
failed fibula reconstruction, 238
foreign-body giant cell reaction, 238
Kent-Vitek Prosthesis (VK-I), 237, 239
polytetrafluoroethylene, 237
posterior-anterior skull film, 241
TMJ replacement systems, 237, 241
type-I Christensen prosthesis, 239
type-II Christensen prosthesis, 240
types, 237
UHMWPE, 237
maxillofacial radiographic technique, 110
meniscectomy
crepitus, 75, 77
curved TMJ scissors, 74
description, 74
disk thinning and perforation, 74, 75
medical-grade silicone sheeting, 77
postauricular approach, 77
with replacement
auricular cartilage see auricular cartilage
autogenous, allogeneic and alloplastic
materials, 78
dermal graft, 78
temporalis muscle and fascial grafts, 81
retained foreign bodies, 78
temporary silastic implant, 76, 77
meniscoplasty
anterior-medially displaced meniscus, 68
disk repositioning, 70
open joint procedures, 57
Mitek anchoring system, 71, 73
Mitek bone-cleat introducer, 71
MRI see magnetic resonance imaging (MRI)
neoplasms, 204, 228–9
nerve injury
condylectomy/screw placement, 232
cranial nerves V and VII, 231
galvanic stimulation, 232
hematoma with endaural approach, 232
necrosis of skin flap, 232
neuropraxia, 231
ophthalmic drops, 231–2
orbicularis oculi, 231
periprosthetic soft tissue, 233
postsurgical keloid, 233
postsurgical palsy, 231
risk of nerve damage, 231
TMJ surgery, 231
trigeminal nerve branches, 232
zygomatic branches, 231, 232
oculo-auricular-vertebral syndrome, 205
orthognathic and TMJ prosthetic
reconstruction
abdominal fat graft, 190
absolute trismus and TMJ ankylosis, 199–200
Biomet microfixation, 195
computer aid modeling, 191
computer-generated fossa design, 191
custom cutting guides, 193
3D stereo laser model, patient’s anatomy, 189
final custom prosthesis design, 191
infected custom metal-on-metal alloplastic
total joint, 194
maxillary osteotomy, 192
oculo-auricular-vertebral syndrome (cont’d)
postoperative panorex and prosthesis
planned positioning, 196
prediction and radiographic tracing, 189
presurgery lateral cephalogram, 189
ramus reconstruction, 189
rhabdomyosarcoma, resection and radiation, 197–9
stages, surgical procedures, 188
trial fossa component, 191, 192
orthopantogram radiography, 5–6
osseous surgery
condylectomy see condylectomy
condyloplasty, 85
condylotomy, 103
eminoplasty see eminoplasty
osteochondroma
facial asymmetry, 215, 216
laterognathia, 215
reconstruction with stock alloplastic total joint, 216
temporomandibular joint and resection, 216
osteotomy
articular eminence, 89
condylar neck, 99, 182
Dunn-Dautrey retractors, 96
extraoral vertical ramus, 214
internal maxillary artery, 96, 97, 99, 164
intra-oral vertical ramus, 103, 119
intraoral vertical subsigmoid, 82, 82, 103, 213, 225
Lefort 1, 198
mandibular repositioning, 183
two-step, 100, 163, 163–4
vertical subcondylar, 102
pathology
benign tumors see tumors
foreign body reactions, 225–6
malignant tumors see tumors
rheumatoid arthritis see rheumatoid arthritis
septic arthritis see septic arthritis
pigmented villonodular synovitis, 223
plain film radiography, 5, 7, 113
polytetrafluoroethylene (PTFE), 77, 78, 237, 239
Proplast®, 237, 239
retromandibular surgical approach
anatomic structures, 49
blunt dissection, 48
curved hemostat, 46
dissection, facial and periosteum, 45
facial nerve monitoring, 43
fascial layers and facial nerve, temporoparietal fascial, 47
mandible exposure, 51
marginal mandibular branch, 48
marking, modified, 49
masseter exposed, 51
nerve stimulator, 48
parotidectomy and extended preauricular incision combination, 42
Risdon submandibular approach, 45
submandibular gland and posterior belly, 50
superficial temporal artery and vein, 42
temporomandibular joint capsule exposure, 45
well-healed, 52
rheumatoid arthritis
bilateral total joint reconstruction and anterior open bite closure, 211
psoriatic, 211
surgical algorithms, 203
temporary cessation, coordination, 204
rhytidectomy, 31, 39, 41, 117
sarcoma
osteogenic, 226, 227, 229, 227
synovial, 228
septic arthritis, 4
acute degeneration, condyle, 210
anterior open bite and progressive joint pain, 210
description, 204
displacement of condyle, 17, 19
hemifacial microsomia with auricular defect, 205
“Hoof” deformity, 206
hypoplastic left condyle from early condylar trauma, 205
imaging, 204
initial aspiration, joint for cytology and culture, 209
interpositional implant, 207
normal class-1 occlusion, 210
normal pain-free function, 210
panorex demonstration, 209
preauricular swelling, 208
rim enhancement, 208
subcondylar fractures, 107
bilateral, 113, 120
displaced, 107, 110, 120
surgical approaches
  decision making, 1–4
  endaural, 39–40
  for internal derangements see internal derangements, surgery
  intraoral, 52, 53
  postauricular, 40, 40–41, 41
  preauricular, 38, 38–9, 44
  prep and positioning, 53, 54, 55
  retromandibular see retromandibular surgical approach
  rhytidectomy, 41
surgical planning
  advantages, 187
  anatomic models, 182–3
  bilateral complete bony TMJ ankylosis, 185
  bilateral TMJ replacement, 186
  computer modeling, 183, 187
  disadvantages, 183, 187
  fossa and condylar components, 182
  initial prosthesis design, 184
  intraoperative imaging, 182
  joint replacement prior to implantation, 182
  malocclusion, 184
  preoperative 3D reconstruction, 183, 187
  prepubertal bilateral mandibular condyle fractures, 185
  pure titanium mesh backing, 186
  stage 1 bilateral gap arthroplasties, 185
  temporal-zygomatic bone loss, 186
  two-piece stereolithic model, 183, 181, 184
  wax-up of prosthesis, 184
  “swan-neck” cervical deformity, 156, 162
  synovial chondromatosis
    axial MRI, 221
    cartilaginous metaplasia, 213
    chondrosarcomas, 228
    MRI images, 220
    skull invasion, 222
T-bar osteotomes, 97, 100
Teflon®-coated fluoroethyl polyethylene (FEP), 237
Teflon/proplast implants
  with fragmentation and wear evident, 207
  giant cell reaction, 208
  interpositional implant, 207
  packaging and demonstration, 206
  perforated, 208
temporomandibular joint (TMJ) surgery complications see complications
  Kent-Vitek Prosthesis (VK-I), 237
  patients, 243
  postsurgical infections, 234
  TheraBite jaw exerciser, 83
  third-body wear phenomenon, 146
TMJ Concepts® Prosthesis, 237
Trauma
  bilateral condylar fractures, 109
  bilateral subcondylar fractures, 113, 120
  3D reconstruction, 113
  “green stick” fractures, 108, 126
  hemarthrosis, 108
  incidence, 106
  intracapsular fracture, 111
  ipsilateral condylar fracture, 107
  mandibular condyle fractures
    classification, 112–15
    signs and symptoms, 109–10
    treatment, 115–16
    mechanism of injury, 106–8
  subcondylar fracture, 107
  symphyseal or parasymphyseal fracture, 107
  temporomandibular region, imaging
    computed tomography (CT), 111–12, 114
    magnetic resonance imaging (MRI), 111–12, 114
    maxillofacial radiographic technique, 110
trigeminal nerve
  auriculotemporal nerve, 33, 34
  foramen ovale position, 34
  inferior alveolar branch, 35
  superficial temporal artery and vein, 35
tumors
  benign
    acute-onset condylar hyperplasia, 213
    aggressive fibromatosis, 219–20
    cephalometric and panorex postoperative, 214
    chin midline and with good joint function, 217
    condylar hyperplasia and good joint function, 214
    CT and MRI scans, 219
    exophytic osteoma, 217
    extraoral vertical ramus osteotony, 214
    facial asymmetry and laterognathia, 215
    giant cell granulomas, 211
    giant cell tumor see giant cell tumor
    gross distension, 220
    hemimandibular hypertrophy, 212
    histologic events, 224
    intraoral vertical subsigmoid osteotomy
    genioplasty, 213
maxillary midline, 215
meniscectomy, 219
normal condyle with degenerative condyle, 212
osteocondroma see osteochondroma
osteoma excision, 218
preoperative and postoperative occlusion, 217
progressive facial asymmetry and malocclusion, 215
synovial chondromatosis, 213
unilateral open bite, 212
malignant
chondrosarcomas, 228
description, 228
malignancy affecting skeletal bones, 229
medial aspect, condyle, 229
paresthesia, 229
ultra-high-molecular-weight polyethylene (UHMWPE), 146, 237
vascular anatomy
condylectomy, 35
external carotid artery, 35
external maxillary artery isolation, 37
maxillary artery and branches, 36
osteotomies, 36
vascularized (fibula) graft
complications, 142
failed hardware and mandibular defect, 140
fibula free flap, 138, 139
free fibular graft, 140
functional status and skeletal symmetry, 141
postoperative physical therapy, 139
virtual surgical planning, 141
vertical dimension of occlusion (VDO), 167
Vitallium®, 239, 240
Wilkes classification, 58, 61, 66