Index

A
ACI. See Autologous chondrocyte implantation (ACI)
Anaesthesia
carbon dioxide arthroscopy, 352
high tibial osteotomy, 273
injection, 350
knee surgery, 350
regional anaesthesia
  ambulatory surgery, spinal, 351
  continuous femoral nerve blockade, 351–352
  epidural, 350–351
  peripheral nerve blockade, 351
  spinal, 351
types, 349
Animal studies
  horses
    arthroscopy, 85
    articular cartilage repair, 84
    macroscopic evaluation, 85
  sheep
    gross evaluation, 87
    groups, 85–86
    histological evaluation, 86
    hypertrophic chondrocyte morphology, 88
    macroscopic evaluation, 86
    microradiographic evaluation, 86
    PRP, 87
Anterior cruciate ligament (ACL),
  MAT, 316–317
Arthroscopy
carbon dioxide, 352
high tibial osteotomy, 274–275
Arthroscopy, of knee, 72
Articular cartilage repair. See also Gel autologous
  chondrocyte implantation (GACI)
calcified cartilage layers, 18, 19
chondrocytes, 18, 19
collagens, 20
deep, radial, or radiate layer, 18, 19
degeneration, 20, 21
extracellular matrix zone, 19, 20
fibrocartilage, 17
horizontal layers, 18
hyaline cartilage, 17
injury and PRP, 344
interterritorial matrix, 19, 20
knee
  addendum, 27–28
  age, 25
  algorithm, 27, 28
  cartilage repair techniques, 23–24
  clinical practice, 24
  defect size, 24–25
  early osteoarthritic defects, 27
  indications and contraindications, 24
  indicators, 24–25
  patient activity, 25
  salvage repair, 27
  treatment selection, for patients, 25–26
noncollagenous proteins
  and glycoproteins, 20
proteoglycans, 19
regeneration, 20–21
superficial or tangential layer, 18
territorial matrix, 19, 20
transitional, intermediate, or middle layer, 18
water, 19
Atelocollagen mixture, preparation of, 64, 65
Autologous chondrocyte implantation (ACI)
  Cartilage Registry Report, 11
cartilage repair, 370
cell and gel mixture, 222–223
clinical outcomes, 11, 226
  conventional, 219
  defect size, 24–25
  exclusion criteria, 221
gel ACI for RA
  arthritic lesion exposure, 223
  post injection of lesion, 224
gel AGI, 219–221
hip
  defect size, 262
  femoral head, 263, 264
  mesenchymal stem cells, 263
orthopaedic and trauma surgery
  cell and gel mixture (ex vivo), 222–223
  conventional surgery, 219
  GACI, 219–221
  indications, 221
  RA, 223–224
  rehabilitation, 223
  surgical technique, 221–222
Autologous chondrocyte implantation (ACI) (cont.)  
patellofemoral joint, 26  
rehabilitation, 223  
sandwich technique, 26, 27  
second generation, 11–12  
surgical technique, 221–222  
third-generation, 11–12  

Autologous collagen-induced chondrogenesis (ACIC™), 217–219  
atelocollagen gel injection, 60  
chondral defect for implantation, 64–66  
collagen, 60  
electron microscopic images, 60, 62, 63  
fibrin, 60  
immunohistochemical staining with type I and II antibody, 60, 61  
microdrilling, 60  
orthopaedic and trauma surgery  
AMIC, 217  
atelocollagen and fibrin mixture injection, 218–219  
microfracture, 217  
surgical procedure, 218  
osteochondral graft, 59  
patient selection  
cartilage imaging protocol, 61  
inclusion and exclusion criteria, 62  
postoperative rehabilitation, 66  
presentation of autologous collagen and fibrin gel mixture, 64, 65  
safranin-O staining, 60, 61  
single-stage arthroscopic procedure, 59  
theatre setup, 63–64  
toluidine blue staining, 60, 61  

Autologous matrix-induced chondroneogenesis (AMIC™), 217, 218  
Microfracture, 52  
osteochondral lesions, talus (see Osteochondral lesions)  
patient selection, 52  
postoperative follow-up, 56  
rehabilitation, 54–56  
surgical techniques  
chondral reconstruction, 53–54  
osteochondral reconstruction, 54, 55  

Bone-marrow-derived mesenchymal stem cells (BMSC)  
arthroscopic evaluation, 207–208  
cellular lineage, 208, 210  
clinical trials, 206–207  
complications, 210  
histological characteristics, 208–209  
IKDC, 211, 212  
indications and contraindications, 207  
Lysholm score, 211, 212  
multiple trials, 207  
osteoarthritis, 205  
patient setup, 207  
physical methods, 206  
postoperative follow-up, 210, 211  
preoperative preparation, 207  
preparation process of, 208–210  
rehabilitation, 210–211  
SF-36, 211, 212  
VAS, 211, 212  
Bone marrow stimulation, 370  
Bridge-in-slot technique, MAT  
arthroscopically assisted, 313–314  
open techniques, 311  

BST-CarGel®  
animal efficacy studies, 100  
blood clot  
retraction and histology, 99–100  
stabilization and adhesion, 100, 101  
clinical experience, 107  
concomitant medications, 102  
description of, 98  
hyaline tissue development, 101  
indications/contraindications, 101–102  
lesion preparation, 103  
mechanical contributions, 100, 101  
v.s. microfracture, 107–108  
pilot clinical use, 107  
post-surgical rehabilitation program, 106  
potential complications and troubleshooting, 105–106  
product packaging, 98  
randomized clinical trials, 107–108  
rehabilitation program, 106  
repair process, 101  
subchondral bone, morphology/biology of, 101  
surgical technique, 102  
BST-CarGel® delivery, 103–105  
BST-CarGel® product preparation, 103, 104  
lesion preparation, 103  
patient knee positioning, 103, 104  
steps for, 103  
WOMAC, 107  

B  
Bioseeds®, 249  
Blood clot, BST-CarGel®  
retraction and histology, 99–100  
stabilization and adhesion, 100, 101  
Bone marrow aspirate concentrated cells (BMAC), 345–346, 371–373  
Bone marrow aspiration, 70  
Bone marrow concentrate (BMC)  
plugs bathed, 71, 72  
preparation, 71  
TruFit®, 73, 76  

C  
Cartilage autograft implantation system (CAIS)  
comparative studies, 159–160  
complications and troubleshooting, 157–158  
patient setup, 156
postoperative rehabilitation, 159
preoperative preparation, 155–156
rehabilitation, 158–159

surgical approach
  defect preparation, 156–157
diagnostic arthroscopy, 156
implantation, 157–159
patellofemoral joint, 156, 157
tibiofemoral joint, 156
technical procedure, 155

Cartilage injuries
  abrasion, 4
chondrogenic cell transplantation
  ACI technology, 10
  aggregates of cells, 9
  autoradiography, 9
  clinical outcomes, 11
  intrinsic repair, 8
  MACI, 12
  mesenchymal stem cell, 10
  microfracture, 12
  randomised animal study, 10
  second generation of ACI, 11–12
  third-generation ACI, 11–12
drilling, 4–5
mesenchymal tissue, 3
osteochondral grafting techniques
  allograft, 5–6
  autografts, 6
periosteal and perichondral resurfacing
  perichondrium, 7–8
  peristeum, 6–7
resection, 4–5
shaving technique, 4
stem cells implantation, 13

Cartilage regeneration system (CaReS®)
  clinical studies, 249–250
  3D aqueous gel, 246
  parameters of biomaterial, 246
  patient selection, 246
surgical techniques
  biopsy, 247
  cell processing, 247
  implantation procedure, 248
  open-wedge technique, 248
  postoperative care, 249
  rehabilitation, 249

Cartilage repair surgery
  allograft transplantation (see Osteochondral allografting techniques)
avtologous cartilage injuries, 369
autologous chondrocyte implantation, 370
bone marrow stimulation, 370
comparative studies, 159–160
complications and troubleshooting, 157–158
DeNovo natural tissue, 155, 159
mesenchymal stem cells, 370–371
OATS, 364 (see also Osteochondral autograft transfer system (OATS))
one-step surgery
  biopsy, 372, 374
  BMAC, 371–373
  MRI, 372, 374
  rehabilitation protocol, 371, 372
patient setup, 156
postoperative rehabilitation, 159
preoperative preparation, 155–156
rehabilitation, 158–159
surgical approach
  defect preparation, 156–157
diagnostic arthroscopy, 156
implantation, 157–159
patellofemoral joint, 156, 157
tibiofemoral joint, 156
technical procedure, 155

Chondral and osteochondral defects
  biomarkers, 171–172
  chondrocyte culture, 166–167
  chondroide patch, 169
  consent, 167
  cost-effectiveness, 172
  disadvantages, 171
  postoperative care, 171
  preoperative score, 166
  preparation of defect, 169
  rehabilitation, 171

Chondrocytes
  articular cartilage, 18, 19
  culture, 166–167

Chondrogenic cell transplantation
  ACI technology, 10
  aggregates of cells, 9
  autoradiography, 9
  clinical outcomes, 11
  intrinsic repair, 8
  MACI, 12
  mesenchymal stem cell, 10
  microfracture, 12
  randomised animal study, 10
  second generation of ACI, 11–12
  third-generation ACI, 11–12

Continuous passive motion (CPM)
  drilling, 40
  GACI, 181
  microfracture, 40, 45
  Corticosteroids, 344–345
  Cryopreservation, 309

D
  Delayed gadolinium-enhanced MRI of cartilage (dGEMRIC), 357, 360–361
Distal femoral varus osteotomy
  clinical outcome, 302–303
  complications, 302
  opening wedge technique, 295
  patient selection, 296
  postoperative care, 302
  radiographic evaluation, 296
surgical technique
  anteroposterior fluoroscopic image, 301
  fixation plate, 299, 301
  guidewire positioning, 297–298
  incision, 297, 298
  intraoperative fluoroscopic image, 299
  intraoperative photograph, 297
  lateral fluoroscopic image, 301
  opening device, 300
  osteotomes, 300
  ostectomy initiation, 299
Double bone-plug technique, MAT
  arthroscopically assisted, 312–313
  open techniques, 311
Double tibial tunnel arthroscopic technique, 314–315
Drilling
  anterograde defect, 38, 39
  cartilage injuries, 4–5
  CPM, 40
  necrosis and accidental injury, 38
E
Enhanced bone marrow stimulation treatment.
  See BST-CarGel®
Epidural anaesthesia, 350–351
Extracellular matrix zone, articular
cartilage, 19, 20
F
Folded blanket technique, 230, 233
Fresh-frozen meniscal allograft, 309
G
GAG-specific chemical exchange saturation transfer
  (gagCEST), 362
Gait training, 331, 334
  protection phase, 330
  transitional phase, 331, 334
Gel autologous chondrocyte implantation (GACI), 219–221
  clinical results
    error-bar graph, 183, 185
    MTT assay, 182–184
    scanning electron microscopy, 183, 184
tKSS-A and tKSS-B scores, 183, 185–186
  complications, 182, 183
  indications and preoperative planning
    biopsy and chondrocyte harvest, 176–177
    cultured cells, transportation, 177
    culture process, 177
    implantation of cells, 178–182
  theater mixing procedure, 177–178
  theater setup, 178, 179
  postoperative rehabilitation, 180
  range of motion, 181
  weight bearing, 181
RA, 223–224
Graft preservation
  cryopreservation, 309
  deep-frozen, 309
  fresh allograft, 308–309
  lyophilization, 309
Graft sizing
  anthropometric-based sizing, 310
  intraoperative, 309
  MRI and CT, 309–310
  radiographic, 310
H
HA. See Hyaluronic acid (HA)
High tibial osteotomy (HTO)
cartilage-preserving surgery, 270
  closing wedge technique, 270
  indications and contraindications, 270–271
  opening wedge technique, 270
osteotomy
  angular correction, 282
  anterior osteotomy, 277, 279
  chisel placement, 278, 280
  chronOS bone wedge posteriorly, 278, 281
  fixation, 279, 282
  guidewire placement, 276
  intra-articular fracture, 280, 284
  lamina spreader, 278, 281
  lateral hinge loss, 281–282, 284
  neurovascular damage, 282
  patella baja, 283–284, 286
  posterior 2/3 osteotomy, 276, 278
  postoperative follow-up, 279–280
  saw blade, 277
  stacking technique, 278, 279
  tibial slope alteration, 282–283, 285
  TomoFix bone spreader, 278, 280–281
  TomoFix plate, 278, 282
pre-op evaluation
  anesthesia, 273
  arthroscopy, 274–275
  Hohmann’s retractor, 276
  JLCA, 272
  mechanical axis, 271–272
  patient positioning, 273, 275
  pes anserinus elevation, 276
  posterior tibial slope, 271, 273
  preoperative planning, 272–274
  surface markings, 274, 275
  techniques, 274
Hip
ACI, 262–263
  differences with location
    femoral head, 261
    proteoglycan content, 260–261
### Index

**microfracture**, 262  
**OATS**, 262  
**osteoarthritis**, 259  
**postoperative rehabilitation**, 264  
**regenerative strategies**, 259–260  
**surgical dislocation**, 260  
**Hyaff-11**, 228  
**Hyaluronan**, 227, 228  
**Hyaluronic acid (HA)**  
- **clinical use**, 342–343  
- **endogenous hyaluronic acid**, 341  
- **viscosupplementation**, 342  
**I**  
**Immunohistochemistry**, 42, 115  
- **mesenchymal stem cell induced chondrogenesis**, 116–118  
**International Cartilage Repair Society (ICRS) grade, of cartilage injuries**, 238, 239  
**International Knee Documentation Committee (IKDC) sum score**, 211, 212  
**J**  
**Japanese Orthopaedic Association score (JOA)**, 43  
**K**  
**Keyhole technique, MAT**, 314  
**Knee cartilage repair, Hyalograft**®  
- **cell isolation and expansion**, 228  
- **Hyaff-scaffold**, 228  
- **hyaluronan**, 227–228  
**operative technique**  
- **ACI technique**, 229  
- **chondrocytes harvest and expansion**, 229–230  
- **millefeuille technique**, 230, 232  
- **mushroom technique**, 230  
- **open hyalograft implantation**, 233, 234  
- **osteochondral defects**, 233, 234  
- **patella hyalograft implantation**, 232, 233  
- **tibial plateau defects**, 230, 232, 233  
- **transarthroscopic chondrocyte technique**, 230–233  
- **patient selection**, 229  
- **postoperative rehabilitation**, 233, 234  
**L**  
**Lyophilization**, 309  
**M**  
**Magnetic resonance imaging (MRI)**  
- **cartilage repair quality**, 44–45  
- **mesenchymal stem cell induced chondrogenesis**, 126  
- **MOCART score**, 92  
- **morphological**, 354–355  
- **noninvasive follow-up**, 89  
- **osteochondral defect**, 240  
- **patellar femoral joint lesions image**, 126  
- **patient selection, TruFit®**, 69–70  
- **preoperative planning process**, 155  
**Magnetic resonance observation of cartilage repair tissue (MOCART)**, 74–75  
**MaioRegen scaffold**  
- **animal studies**  
  - **horses**, 84–85  
  - **sheep**, 85–88  
- **biological validation**, 84  
- **biomimetic osteochondral**, 90  
- **characterization**, 84  
- **clinical application**  
  - **contraindications**, 88  
  - **indications**, 88  
  - **postoperative rehabilitation**, 88–89  
  - **surgical technique**, 88  
- **equine type I collagen**, 82  
- **estimation of maturation**, 89  
- **high-resolution MRI technique**, 89  
- **IKDC evaluation**, 91  
- **implant on trochlea**, 93  
- **inclusion and exclusion criteria**, 90  
- **influencing factor**, 91–92  
- **MOCART score**, 92  
- **morphological and mineralization gradient**, 82–83  
- **osteochondral tissue repair**, 89  
- **preparation**, 83–84  
- **properties**, 81  
- **subchondral bone**, 82  
- **Tegner score**, 91, 92  
**MAT. See Meniscal allograft transplantation (MAT)**  
**Matrix-induced autologous chondrocyte implantation (MACI)**  
- **assessment**  
  - **injury**, 240–241  
  - **patient**, 239–240  
- **chondral injuries**, 237  
- **chondrocyte implantation**, 237, 238  
- **chondrogenic cell transplantation**, 12  
- **patient selection**, 238–239  
- **post-operative evaluation**  
  - **arthroscopic assessment**, 242–243  
  - **clinical outcomes**, 243  
- **post-operative management**  
  - **graft maturation**, 241–242  
  - **rehabilitation**, 242  
- **preoperative management**, 241  
- **surgical technique**  
  - **chondrocytes implantation**, 241, 242  
  - **exposure**, 241  
  - **preparation of defect**, 241  
**Meniscal allograft transplantation (MAT)**  
- **anteroposterior radiographs**, 306  
- **arthroscopically assisted**  
  - **double bone-plug**, 312–313  
  - **keyhole technique**, 314  
  - **through (bridge-in-slot)**, 313–314  
- **arthroscopic techniques**  
  - **double tibial tunnel**, 314  
  - **single tibial tunnel**, 314–317
Meniscal allograft transplantation (MAT) (cont.)

associated procedures
ACL, 317
cartilage treatment, 317
osteotomies, 317–318
capsular fixation, 311
graft preservation
cryopreservation, 309
deep-frozen, 309
fresh allograft, 308–309
lyophilization, 309
graft sizing
anthropometric-based sizing, 310
intraoperative, 309
MRI and CT, 309–310
radiographic sizing, 310
meniscal horns fixation, 311
open techniques
double bone-plug technique, 311
soft tissue fixation, 312
through (bridge-in-slot), 311–312
rehabilitation, 318–319
risks and complication
disease transmission, 319
failure rate, 319
graft extrusion, 320
immunological reaction, 319
improper sizing, 319–320
selection of patients and preoperative evaluation
contraindication, 307
indication, 307
outerbridge grading, 307
physical examination, 307–308
radiological planning, 308
Mesenchymal stem cell induced chondrogenesis (MCIC™)
electron microscopy, 116, 119, 120
fibrin gel, 114
patient selection
clinical, 116–117
radiographic, 117–118
postoperative rehabilitation, 124–125
pre-and postoperative comparison, 125–126
preclinical study
assessment, 115
electron microscopy, 116, 119, 120
gross appearance, 116
histochemical staining, 116
immunohistochemistry, 116–118
surgical technique, 114–115
surgical technique
BMAC and fibrin gel preparation, 121–124
bone marrow harvest and concentration, 121
chondral defect, preparation of, 122
implantation of graft, 122–125
theatre and patient setup, 118, 121
Mesenchymal stem cells (MSCs), 370–371
Microdrilling, ACIC™, 60
Microfracture (MF), 97
advantages, 38
AMIC™, 52
arthroscopical procedure, 36
arthroscopic picture of debrided cartilage
defect, 36
articular cartilage and clinical outcome, 42
bleeding control, 37
blood flow from, 36–37
cartilage defect debridement, 36
chondrogenic cell transplantation, 12
cohort study, 41
CPM, 40
disadvantages, 38
durability, 44
follow-up, 40
high-impact athletes, 42
hip, 262
indications, 38
intrinsic repair mechanisms, 35
JOA, 43
motorised shaver systems, 36
osteoarthritic knees, 41
outcomes, 40
effect of age, 45
lesion location and size, 45
postoperative CPM and weight bearing, 45–46
perforation, 36, 37
pitfalls, 37
postoperative protocol and treatment, 38, 43
quality of cartilage repair, 44–45
rehabilitation, 38
Millefeuille technique, 230, 232
Mosaicplasty technique
defect preparation, 134–135
graft harvest, 135
graft implantation
deliver, 136
dilate, 136
drill, 135–136
postoperative application, 136
surgical approach
arthroscopic portal selection, 133–134
open mosaicoimplasty, 134
Mushroom technique, 230

O
OCL. See Osteochondral lesions (OCL)
Open hyalograft implantation, 233, 234
Open-wedge technique, 248
Orthobiologics
bone marrow aspirate concentrate, 345–346
corticosteroids, 344–345
hyaluronic acid
clinical use, 342–343
endogenous hyaluronic acid, 341
viscosupplementation, 342
PRP
articular cartilage injury, 344
definition, 343
osteoarthritis, 344
Orthopaedic and trauma surgery
ACI
cell and gel mixture (ex vivo), 222–223
conventional surgery, 219
GACI, 219–221
indications, 221
RA, 223–224
rehabilitation, 223
surgical technique, 221–222
ACIC
AMIC, 217
atelocollagen and fibrin mixture injection, 218–219
microfracture, 217
surgical procedure, 218
microfracture, 216
Osteoarthritis (OA)
hip, 259
incidence, 259
microscopical features, 20, 21
orthobiologics, 344
pathogenesis of, 239
PRP, 344
Osteochondral allografting techniques
allografts, 149–150
complications, 149
dowel graft technique, 143–144
graft insertion, 147–148
graft preparation, 146–147
indications for, 142
lesion inspection and preparation, 145–146
postoperative management, 149
preoperative preparation, 143
press-fit plug technique, 143–144
shell graft technique, 148–149
surgical approach, 144
Osteochondral autograft transfer system (OATS)
complications, 136, 138
indications and contraindications, 132–133
mosaicplasty technique (see Mosaicplasty technique)
patellar implantations, 139
postoperative application, 136
preoperative preparation, 133
rehabilitation, 136–138
Osteochondral autologous transplantation (OATS), 370
clinical outcome, 28
defect size, 24–25
patellofemoral joint, 26
Osteochondral grafting techniques
allografts, 5–6 (see also Osteochondral allografting techniques)
autografts, 6
Osteochondral lesions (OCL)
collagen I/III matrix, 257
complications, 256
historical development, 253
MACI, ACI and OATS, 256
patient positioning and selection, 254
postoperative follow-up, 256
preoperative preparation, 254
rehabilitation, 256
surgical approach, 254–256
technical details, 253–254
Osteochondral reconstruction, AMIC™, 54, 55
Osteotomy
HTO
angular correction, 282
anterior osteotomy, 277, 279
chisel placement, 278, 280
chronOS bone wedge posteriorly, 278, 281
fixation, 279, 282
guidewire placement, 276
intra-articular fracture, 280–281, 284
lamina spreader, 278, 281
lateral hinge loss, 281–282, 284
neurovascular damage, 281
patella baja, 283–284, 286
posterior 2/3 osteotomy, 276, 278
postoperative follow-up, 279–280
stacking technique, 278, 279
tibial slope alteration, 282–283, 285
TomoFix bone spreader, 278, 280–281
TomoFix plate, 279, 282
MAT, 317–318
P
Periosteal and perichondral resurface
perichondrium, 7–8
periosteum, 6–7
Platelet-rich plasma (PRP), 87
articular cartilage injury, 344
definition, 343
osteoarthritis, 344
Porcine TEC model, 192
cell proliferation assay, 194
macроскопical and histological assessment, 195–197
Pre-and postoperative radiological assessment
biochemical imaging
delayed gadolinium-enhanced MRI of cartilage, 357, 360–361
gagCEST, 362
sodium imaging, 361
T2 mapping, 362–363
3-D MOCART score, 357–359
importance of, 355–356
MOCART score, 356–357
requirements
coils, usage of, 355
morphological MRI, 351–355
signal-to-noise ratio, 354
Yulish classification, 356
Pre- and postoperative radiological assessment
Press-fit plug technique, 143–144
Protection phase
neuromuscular function, 329–330
restoring joint homeostasis, 329
ROM improvement, 329
weight bearing and gait training, 330
PRP. See Platelet-rich plasma (PRP)
**R**

Range of motion (ROM)
- distal femoral varus osteotomy, 302
- protection phase, 329
- remodeling phase, 333, 335
- transitional phase, 330, 331

Regional anaesthesia
- continuous femoral nerve blockade, 351–352
- epidural, 350–351
- peripheral nerve blockade, 351
- spinal, 351

Rehabilitation
- ACI, 223
- ACIC™, 66
- AMIC™, 54–56, 256
- BMSC, 210–211
- BST-CarGel® postsurgical program, 106
- CAIS, 158–159
- CaReS®, 249
- cartilage repair surgery protocol, 371, 372
- chondral and osteochondral defects, 171
- DeNovo NT, 158–159
- MACI, 242
- MAT, 318–319
- maturation, 334, 336–337
- MF, 38
- OATS, 136–138
- OCL, 256
- orthopaedic and trauma surgery, 223
- principles, 328
- protection phase
  - neuromuscular function improvement, 329–330
  - restoring joint homeostasis, 329
  - ROM improvement, 329
- remodeling phase
  - core stability improvement, 334, 336
  - eccentric training, 334, 335
  - ROM improvement, 333, 335
- transitional phase
  - gait training, 331, 334
  - ROM improvement, 330, 331
  - sensomotoric training, 330, 332
  - strengthening, 331, 333
- TruFit®, 73–74

Rheumatoid arthritis (RA), 223–224

**S**

Scaffold-free mesenchymal stem cells
- cultured cells, 189
- tissue-engineered construct
  - adhesive properties, 192
  - cartilage regeneration, 198–201
  - chondrogenesis of, 192, 193
  - development of, 190–191
  - mechanical assessment, 195, 198
  - porcine model (see Porcine TEC model)
- Scanning electron microscopy (SEM)
  - GACI, 183, 184
  - hyaluronic acid/fibrin composites, 116, 119
  - morphological structure of chondrocytes, 183, 184
- Shell graft technique, 148–149
- Single tibial tunnel arthroscopic technique, 314–317
- Soft tissue arthroplasty
  - perichondrium, 7–8
  - periosteum, 6–7
- Spinal anaesthesia, 350–351
- Stimulation techniques. See Drilling; Microfracture (MF)
- Synovitis, 249

**T**

Theatre setup
- ACIC™, 63–64
- MCIC™, 118, 121
- Tibial plateau defect, 230, 232, 233
- Tissue-engineered construct (TEC)
  - adhesive properties, 192
  - applications, 200–201
  - cartilage regeneration
    - 3D tissue development, 198–199
    - structural advantage, 199
    - in vitro experiments, 200
    - chondrogenesis of, 192, 193
    - development of, 190–191
    - mechanical assessment, 195, 198
    - porcine model (see Porcine TEC model)
- T2 mapping, 362–363
- Transarthroscopic chondrocyte technique, 230–232
- Transitional phase
  - gait training, 331, 334
  - ROM improvement, 330, 331
  - sensomotoric training, 330, 332
  - strengthening, 331, 333
- TruFit®
  - clinical follow-up, 74
  - deep phase, 69
  - outcomes, 74–79
  - patient selection, 69–70
  - patient setup and BMC preparation, 70–72
  - potential complications and troubleshooting, 73
  - rehabilitation, 73–74
  - superficial phase, 69
  - surgical approach
    - arthroscopy of knee, 72
    - BMC, 73, 76
    - center of trochar drilling, 72, 74
    - chondral lesion exposed, 72, 73
    - cut down with serrated knife, 73, 76
    - depth measurement, 73, 75
    - EVICEL® fibrin sealant, 73, 79
    - final construct of, 73, 78
    - insertion of, 73, 77
    - plug after cut down, 73, 77
    - plug mosaicplasty, fibrin sealant, 73, 79
plug placed into loading device, 72, 75  
recipient hole, 72, 74  
tamp, 73, 78  
trochar malleted lesion, 72, 73

W
Western Ontario McMaster (WOMAC) Osteoarthritis Index questionnaire, 107

V
Valgus deformity. See Distal femoral varus osteotomy  
Viscosupplementation, 342  
Visual analogue scale (VAS), 211, 212