Index

Note: Page numbers in italic refer to figures, those in bold to tables.

A
ablation
EUS-guided, 240–241
laser, 241
of tissue, 287
abcesses
drainage of, 234
published studies, 264
perianorectal, 233
accreditation, of electronic health records (EHRs), 42–43
achalasia, HFUS, 89
acoustic mirrors, 1–2
acoustic shadow, induodenal lipoma, 7
acute biliary pancreatitis, 205–206
EUS studies, 206
acute pancreatitis (AP), 34, 182–183
after FNA, 78
calcific debris, 161
fluid collection, 254
inflammatory (AIP), 161–162
recurrent (RAP), 183
adenocarcinoma, 125
with cystic degeneration, 177
diffuse gastric, 124
adenomas
biliary, 222
duodenal, 131–132
adenomyomatosis, duodenal, 145
administration, 40–41
adrenal glands
left (LAG) EBUS, 111
linear EUS, 57
metastasis, 96
radial EUS, 50–51
“seagull”, 98
air bubbles, attenuation by, 12
alcohol, in hemotasis, 270
Aldrete scoring system, 37
algorithmic approach to FNA, 74
American Association for the Study of Liver Diseases (AASLD), 219
American Joint Committee on Cancer (AJCC), staging criteria, 44, 116, 126, 163
American Association for the Study of Liver Diseases (AASLD), 219
American Society of Anestesthesiologists (ASA), 36
American Society for Gastrointestinal Endoscopy (ASGE), 34, 54
FNA guidelines, 74
recommendations for reports, 40–41
training guidelines, 273, 281–282
amine precursor uptake and decarboxylation (APUD) tumors, 140
ampulla, 22, 23
ampullary adenomas, 131–133
ampullary biopsy, in AIP, 197–198
ampullary cancer
extending up bile duct, 133
staging, 132
T3, T2
ampullary carcinoma, 127, 131–133
EUS accuracy, 278
ampullary lesions, 132–133
ampullary tumors, IDUS, 91
anal cancer, 231
anal sphincers
defects, 231
radial EUS, 53
anatomy
approach to understanding EUS, 24–26
duodenum, 21, 22–23
pancreatic and peripancreatic, 151–153
regional, 15–24
antibiotics
after cyst aspiration, 178
after FNA, 78
prophylactic, 34, 73
anticoagulation, 32
antitumor agents, EUS-guided delivery, 239–240
aorta, linear EUS, 55
aortopulmonary window (APW), 49
linear EUS, 56
archiving, 85
Armed Forces Institute of Pathology (AFIP), classification of pancreatic neoplasms, 151
arterial anatomy, 152–153
arterial invasion, in pancreatic cancer, 164
artifacts, 10–13
ascites, 127
as anechoic band of fluid, 131
detection of, 131
periarterial, 131
perihepatic, 218
aspiration
fine needle (FNA), 27
mediastinal cyst, 95
assessment, pre-procedure, 36
assistants, 31–32
attenuation
artifacts, 11–12
and tissue penetration, 7–8
autoimmune pancreatitis (AIP), 193
classic EUS features, 198
classification, 193
diagnosis, 193–196
differentiating characteristics of types 1 and 2, 194
distinguished from pancreatic cancer, 195
EUS imaging features, 198–200
focal mass images, 199
histologic triad of type 1, 194
needle biopsy, 195
presentation, 193
role of other tests in, 196–198
treatment and outcomes, 200–201
axial resolution, 6
effect of US frequency on, 7
azygous vein, linear EUS, 56
B
bacteremia, 34, 78
balloons, 29
dilatation, 251, 256, 263
use of, 2, 123
Barrett esophagus, HFUS, 89
beam pattern, effect of US frequency on, 7
beat frequency, 10
benign disorders, stomach and duodenum, 123–125
benign mass lesions, 160–162
benzodiazepines, 36
bile duct strictures, IDUS, 91
bile peritonitis, 35
after FNA, 78
biliary access
complications, 252
equipment, 248
EUS-guided, 35, 248
indications for, 248–249
outcomes, 251–252
technique, 249–251
biliary adenomas, 222
biliary disorders, intrahepatic, 222
biliary drainage
EUS-guided (EUS-BD), 209–211, 212
studies on, 210
biliary strictures, indeterminate, 206–208
biliary tree, EUS imaging in AIP, 198–199
biopsy
ampullary, 197–198
aspirate, 82–83
core, 82–83, 146
depth, 146–147
needle size and preparation, 83
personnel, 82–83
suction, 83
see also cell block
biopsy forceps, 146
biopsy material, preparation and quality, 82
bladder cancer, 234
bleeding, 34–35
extraluminal, 78
gastrointestinal (GI), 267
see also hemostasis

endoscopic retrograde cholangiopancreatography (ERCP), 3, 27, 55
in AIP, 196–197
compared to EUS in CP, 187–188
and fluoroscopy, 30
periampullary lesions, 133
endoscopic sonoelastography (ESE), 104
endoscopic submucosal dissection (ESD), 147
endoscopic ultrasonography (EUS) abnormal in CP, 186
accessories, 29, 286
accuracy of, 278
after neoadjuvant therapy, 100
approach to understanding anatomy, 24–26 assistants, 31–32
beginnings of, 1–4
biliary, 204–216, 248–253
biopsy material preparation and quality, 82
buttons, 30
clinical impact of staging, 229–230
colorectal, 225–238
combined with EBUS, 110–111
compared to CT, 19, 97, 228–229
diagnostic modalities in CP, 186–188,
187
compared to MRI, 228–229
diagnostic reach, 103
tumor (T), 116–117
complications, 111–112
contrast-enhanced, see contrast-enhanced EUS (CEUS) cost, 100
cross-sections left and right from aorta, 20
diagnostic reach, 103
duodenum images, 25
elastography, see elastography
for esophageal cancer, 116–122
and esophageal dilation, 35
expansion of indications, 288–289
experience levels, 282
fine-needle aspiration, see fine-needle aspiration (FNA)
first International Workshop on, 3
future of, 285–289
general principles of, 15
guided drainage, 234, 261–266
guided-delivery of antitumor agents, 239–240
hemostasis, 267–272
hospital privileges, 281–282
image-enhancing techniques, 199–200
imaging principles and fundamentals, 5–14
in inflammatory bowel disease, 233–234
inflammatory pancreatic diseases, 182–192
intrasplenic spaces, 22–23
interventions, 44
intrapulmonary tumors, 108–109
key images, 109
laboatory role in, 85
learning anatomy of, 15–26
linear-array, see linear-array endoscopic ultrasound
in liver disease, 217–224
lung cancer metastases, 109–110
lung cancer staging, 105–110
mediastinum applications, 95–101
for metastatic disease, 99
Minimal Standard Terminology (MST) for, 41
nature of practice in, 27
new techniques in, 10
non-GI applications, 287–288
in obstructing tumors, 120
for pancreatic cysts, 172–181
in patients with RAP, 183
personnel, 82–83
phantom images, 280
procedure, 34–39, 106
process, 30
radial, see radial endoscopic ultrasonography
rationale in NSCLC, 96–97
reporting software, 43
reports, see endoscopic reports
rescue, 97
room setup, 29–31
simulators, 277–281
staging, 163–164, 226–227
of subepithelial masses, 138–139
in superficial cancers, 120
technical aspects, 120
therapeutic, 239–247
accessory devices, 286–287
three-dimensional, 229
training, see training, EBUS/EUS
transesophageal, 95
Users Group, 3–4
vascular interventions, 288
endosonography, early days of, 1
eosinophilic esophagitis, HFUS, 89
equipment, EUS, 27–29
esophageal cancer, 3
EUS image of, 12
HFUS, 89
linear examination, 121
location defined, 116
management of, 119
radial examination, 120–121
reporting of, 44–45
staging, 116
nodes (N), 117–119
tumor (T), 116–117
technical aspects of EUS, 120
esophageal carcinoma
EUS accuracy, 278
HFUS in staging, 89
esophageal dilation, 35
esophageal dilators, 29
esophageal ultrasound with bronchoscope (EUS(-B)),
mediastinal anatomy, 106–107
esophageal varices
bleeding, 268
HFUS, 89
esophagus
adenocarcinoma, 118
anatomy, 15–16
HFUS, 89
linear EUS, 55–56
and major chest vessels, 16
mediastinal window, 48
mediastinum, 117
squeamous cell carcinoma, 117
subepithelial masses, 139
ever structures of chest, 18
examination technique, gut wall, 47–48
exocrine pancreatic neoplasm, 151
experiential learning theory, 276
extraduodenal spaces, 22–23
extraesophageal spaces, 15–16
extrastrachial spaces, 16–22
extranodal marginal-zone B-cell lymphoma, 130
extrarectosigmoid space, 23–24
extrinsic compression lesions, 145–146

F
fat, 8–9
fentanyl, 36
fiberoptics, 1
fiducial markers, EUS-guided placement, 241–242
fine-needle aspiration (FNA), 27, 72, 261
accessing target lesions, 74–75
algorithmic approach, 74
cytology, 82–87
duodenal wall infiltration, 73
equipment and staffing, 73–74
establishing procedural goals, 72
lesion, 139, 143–145
HUS, 90
leiomyosarcoma, HUS, 90
lesions
accessing FNA targets, 74–75
ampullary, 132–133
benign duodenal, 131–133
cystic liver, 221–222
epithelial compression, 145–146
hepatic benign, 221
malignant hepatic, 219–221
in muscularis propria, 143–145
myogenic, 231–232
pancreatic cystic, 45, 173
primary lung, 99
sampling, 146
subepithelial, 45, 231–232
lightdale, C., 1, 3
linear echoendoscopes, 225
linear endobronchial ultrasonography; technique and
procedure, 102–104
linear endosonographs, displaying of, 55
linear array echoendoscopes, 27, 28, 249
in esophageal cancer, 121
linear-array endoscopic ultrasonography, 54
duodenum, 57–59
esophagus, 55–56
examination technique, 54–55
in liver studies, 217
in NSCLC, 98
rectum, 59
stomach, 56–57
linitis plastica, 124, 128–129
HUS, 90
of rectum, 231
lipomas, 139–140
gastric, 140
HUS, 90
liquid-based preparations, 84
liver
adenomas, 221
assessment, 166
nonresectability, 220
cirrhotic, 218
elastography, 68
eUS imaging of, 217–218
FNA of metastases, 74
focal nodular hyperplasia, 221
hemangiomata, 221
homogenous normal parenchyma, 218
lesions
benign, 221
cystic, 221–222
malignant, 219–221, 220
metastases, 220–221
necrosis, 220
parenchymal abnormalities, 218–219
in hepatic steatosis, 219
perihepatic ascites, 218
radial EUS, 49
uncommon neoplasms, 220
low-molecular-weight heparin (LMWH), 78
luminal cancer, reporting of, 44–45
lungs
avoiding upstaging tumors, 106
primary lung, 99
lymph nodes
accuracy of EUS elastography, 68
aspiration of metastasis, 166
assessment in gastric cancer, 126–127
CEUS image, 287
colorectal, 226–227
cystic fluid, 173
monitoring, of sedation, 37
monooamine oxidase inhibitors, 36
morphology, of pancreatic cysts, 172
Mountain and Dresler lymph node classification, 96
muscarinic-producing tumors, IPUS, 91
mucinous cystadenocarcinoma, 174
mucinous cystic neoplasms (MCNs), 174–175
mucosa, 8
cysts, 139
polyps, 139
removal of, 146–147
multifocal strictures, in AIP, 197
musculair mucosa, 8–9
musculair propria, 8–9
invasive tumor, 118
lesions in, 143–145
motions, 173
malignant, 231–232
N
N-staging, 117–119, 162
accuracy of, 228
naloxone, 36
National Comprehensive Cancer Network (NCCN), 96, 126
National Endoscopy Database, 42
carcinoma
of liver, 220
of pancreas, 257–258
needle-track seeding, after FNA, 35, 78–79
needles, 29
for biliary access, 248
for celiac plexus blockade/neurolysis, 243
multifidus delivery, 241
preparation of, 83
ProCore biopsy, 287
size of, 76, 83
Trucut biopsy (TCB), 75, 83, 124, 200
neoadjuvant chemoradiationtherapy
EUS after, 100
staging after, 119
neuroendocrine tumors, HUS, 90
neutrophils, in AIP, 196
non-cautery-based techniques, 256
non-small-cell lung carcinomas (NSCLC), 95, 102
EUS in early, 97
rationale for EUS, 96–97
nonneoplastic pancreatic cysts, 176
non specular reflectors, 8–9
nonvariceal GI bleeding, 267–268
nurses, training of, 31–32
O
Olympus Optical Company, 1, 3–4, 27
echoendoscopes available, 28
EUS endoscopes, 106
HUS probes, 89
ultrasound miniprobes available, 29
OncolGel, 240
opiates, 36
Organization Mundial D’Endoscopie Digestif
(OMED), 41
outcome studies, on subepithelial masses, 146
overstaging, gastric cancer, 127
P
paclitaxel, 240
palpation, 10
pancreas
anatomy, 151–153
benign mass lesions, 160–162
blood supply, 153
body and tail radial EUS, 49–50
cpopic, 142
EUS
and cancer staging, 162–166
imaging in AIP, 198
linear, 57
radial, 50
RFA, 241
pancreas (continued)
EUS-guided access, 35
fatty infiltration, 161
heterotopic, 142
HFUS, 91
hue histogram, 63
hypoechogenic mass in, 153
inflammatory diseases of, 182–192
lymphatic drainage of, 153
metastatic RCC, 160
metastatic squamous cell, 160
missed tumors, 154–155
mucinous cyst adenoma, 174
normal ventral, 152
qualitative elastography of, 62
serous cystadenoma (SCA), 176
solid neoplasms, see solid pancreatic neoplasms
solid pseudopapillary tumor (SPT), 159, 176
strain ratio, 63
tissue sampling, 156–157
in type 1 AIP, 199
pancreatic adenocarcinoma
5-year survival, 163
EUS-guided injection, 239
FNA, 73–74
IDUS, 91
pancreatic cancer, 3, 151
and CP, 188
distinguished from AIP, 195
EUS and staging, 162–166
pancreatic carcinoma, EUS accuracy, 278
pancreatic cystic neoplasms, 174–176
pancreatic cysts, 13
EUS FNA technique, 178
EUS for, 172–181
evolving approaches, 178–179
fluid analysis, 84
fluid in, 8
FNA of, 77
lesions, 173
characteristics, 173–177, 174
reporting of, 45
pancreatic disease, elastography, 62–66
pancreatic duct
adenocarcinoma, 151
radial EUS, 50
stone, 12
pancreatic endocrine neoplasm, 158
cystic, 159
pancreatic fluid, collection drainage, 254–260
pancreatic head, radial EUS, 51
pancreatic mass, FNA, 73, 154
pancreatic metastases, 159–160
pancreatic neuroendocrine tumors (PNETs), 158, 241–242
pancreatic pseudocyst, 145
pancreatic rest, 142
pancreatic strictures, IDUS, 91
pancreaticobiliary stations, 49–52
pancreaticobiliary disease, 12, 185
pancreatitis, 35
elastography, 65–66
reporting of, 45
Papanicolaou (Pap) staining, 84
pathology, quality of interpretation, 85
patients, monitoring after FNA, 78
pelvic abscess drainage, published studies, 264
pelvic endometriosis, 232–233
pelvic fluid
collection drainage, 261–266
fluoroscopic images, 262
pelvic malignancies, 234
pelvis, 25
Pentax Company, 27
echoendoscopes available, 28
EUS endoscopes, 106
perforation, 2, 35
perianpnetral abscess, 233
perianpnetral fistulas, 233–234
periportal lymphocytic inflammation, in AIP, 196
periportal lymphoplasmacytic inflammation, 194
perisplenic adenitits, invasive tumor, 118
peripancreatic fluid collection, 254
Philadelphia chromosome, 143
photodynamic therapy (PDT), 241
piezoelectric crystals, 5–6, 15, 27
pleura, invasive tumor, 118
polyps
adenomatous, 131
mucosal, 139
portal confluence, 152
portal hypertension, 218–219, 268–269
portal vein, 152
cavernous transformation, 166
postinjection tomography (PET), 97, 102
post-procedural, monitoring, 37
pre-procedure assessment, 36
presentation, of AIP, 193
primary lung lesions, 99
primary sclerosing cholangitis, 222
probes
high-frequency, 286
rigid, 225
procedural goals, in EUS FNA, 72
procedural monitoring, 37
procedures, EBUS/EUS combined, 110–111
processing, 32
promethazine, 37
propofol, 37
prostate cancer, 234
prostate gland, radial EUS, 53
pseudoneuromyrrys
benign of, 269–271
of splenic artery, 270
pseudocysts, 255, 258
see also inflammatory pancreatic fluid collections
Q
quality control, 40
R
radial endoscopic ultrasonography, 47
examination technique, 47–48
mediastinum, 48–49, 98
pancreaticobiliary stations, 49–52
rectum, 52–53
radial-array endoscopic probe, 27, 28, 225
in esophageal cancer, 120–121
radiation
restaging after, 230–231
therapy, 240
radiofrequency ablation (RFA), 241
radiopaque markers, 241–242
rapid on time evaluation (ROSE), 78, 85
rectal adenocarcinoma
T1, 226
T2, 227
rectal cancer
EUS staging, 229
reporting of, 44–45
variability in staging, 228
rectal carcinoma, EUS accuracy, 278
rectal tumor (T3N1), 227
rectal varical bleeding, 269
tocolitis, 232–233
rectum, 225
anatomy, 23–24
linear EUS, 59
limitsis plastic, 231
radial EUS, 52–53
subepithelial masses, 139, 232
recurrence, colorectal carcinoma, 230
reflectors, 8–9
ReGel, 240
renal cell carcinoma (RCC) metastasis, 99
pancreatic, 160
rendezvous technique, 250
reporting, structured, 41–42
reports, see endoscopic reports
resolution cell, 7
restaging, after chemoradiation, 230–231
reverberation artifacts, 10–11
right atrium, linear EUS, 55
right hepatic artery, aberrant, 153
rigid probes, 225
room setup, 29–31
Rosemont criteria, 185, 186
S
safety, of FNA, 78–79
sampling
in CP, 188
EUS-guided, 156–157, 188
order to avoid upstaging, 106
tissues, 146–147
Savary-type dilators, 29
scatterers, see nonspecular reflectors
schedulers, 32
screening, solid pancreatic neoplasms, 156
sedation, 36–37
for colonic examination, 226
seminal vesicles, radial EUS, 52
sepsis, 34
septated mucinous cyst adenoma, 178
serotonin syndrome, 36
serous cystadenomas (SCAs), 176
side lobe artifacts, 12–13
sigmoid colon, 26
simulators, 277–281
EASE-R, 279–280
GI Mentor II, 278–279
live swine model, 279
Sival, M.V., Jr., 1, 3
slides, preparation and staining, 83–84
small bowel, HFUS, 90
small-cell anaplastic carcinoma, 108
small-cell lung carcinoma (SCLC), 99
software
for EUS reporting, 43
web sites for, 43
solid pancreatic lesions
elastography, 63–65
EUS imaging and diagnosis, 154–162
solid pancreatic neoplasms
detection of, 154
EUS for diagnosis and staging, 151–171
EUS-guided tissue sampling, 156–157
invasion in, 164–165
screening, 156
solid pancreatic tumor, reporting of, 45
solid pseudopapillary tumors (SPTs), 159, 176
sound waves, 5
specimens
handling in EBUS/EUS, 112
obtaining adequate FNA, 76–78
specular reflectors, 8–9
spleen, linear EUS, 57
splenic artery, pseudoneuromyrrys, 270
splenic vein, 152
splenules, radial EUS, 51
squamous cell carcinoma, FNA
image, 110
staging after neoadjuvant chemoradiotherapy, 119
ampullary cancer, 132
clinical impact, 229–230
complete mediastinal, 110–111
esophageal cancer, 116
gastric cancer, 126, 127
gastric lymphoma, 130–131
interobserver variability, 228
lymph node (N), 117–119, 226–227
accuracy, 228
metastases (M), 119
pancreatic cancer, 162–166
tumor, node, metastasis (TNM), 44–45
tumor (T), 116–117, 226
accuracy of, 227
staging techniques, mediastinal, 111
stationed withdrawal, 3
stent, malignant, 29
stenosis
advancement, 251
deployment, 252
double pigtail, 256
insertion, 256
number and size of, 264–265
self-expandable metallic (SEMS), 256–257
transcolonic, 263
stomach
anatomy, 16–22
3D, 19
benign disorders, 123–125
dedosonographic stations, 56–57
EUS of, 123–137
granular cell tumor, 141
HFUS, 89–90
of wall, 88–89
and intrabiliary bile duct, 249
linear EUS, 56–57
malignant disorders, 125–129
radial EUS examination of, 48
radial EUS views from, 49–51
stomal cell tumors, 143
subepithelial masses, 139
storage, wall-mounted, 30
storiform fibrosis, 194
strain ratio, 62
of pancreas, 63
stomal cell tumors, 143–145
of stomach, 143–144
styles, in FNA, 76
subcarina, in NSCLC EUS, 98
subcarinal node, EBUS image, 107
subcarinal region, linear EUS, 55
subepithelial lesions, reporting of, 45
subepithelial masses
 differential diagnosis, 139
endoscopic findings, 138
EUS
 imaging techniques, 138–139
 in management of, 146
evaluation, 146
imaging studies, 146
in mucosal layer, 139
outcome studies, 146
in submucosa, 139–142
submucosa, 8
EUS in mass evaluation, 146
suction
in biopsy, 83
during FNA, 76
superficial cancers, 120
superior vein, 152
SurePath, 84
switcher box, 31
Systematized Nomenclature of Medicine (SNOMED), 41
T
T-staging, 116–117, 162
accuracy of, 227
T1 disease, 116–117
T2 disease, 117
T4 disease, 99
tangential scanning, 11
artificial layer thickness increase, 12
telemedicine, 274, 281
terminology, 281
standard, 41
therapeutic accessory devices, 286–287
ThinPrep, 84
thorax
 nodal groups, 56
transaxial CT images, 17
three-dimensional EUS (3D EUS) imaging, colorectal
 staging, 229
thrombin, 269–270
through-the-scope (TTS) dilators, 29
through-transmission enhancement, 8
thyroid gland lobes, 49
time gain compensation (TGC), 7
time-varying gain (TVG) compensation, 8
Tio, L., 3
tissues
 ablation, 287
analysis and management, 288–289
and attenuation, 7–8
detection of movement, 9–10
effect on images, 8–9
effect of US frequency on penetration, 7–8
hardness of, 61
sampling, 124, 146–147
in CP, 188
EUS-guided, 124, 156–157, 200
and wave transmission, 5
TNFerade, 239–240
trachea, endoscopic view, 105
training
EBUS/EUS, 4, 100, 112, 273–284
learning EUS, 274–281
adult learning theory, 276
credentialing, 281
analysis and management, 276
EUS imaging, 281
dimensions for, 275
experience levels, 282
hospital privileges, 281–282
Internet resources, 281
learning curves, 275–276
contrast agent (UCA), 10
motivation, 274–275
practical aspects, 277–281
published data on experiences, 276–277
simulators, 277–281
telemedicine, 274, 281
terminology, 41, 281
visual perception and reality, 275
options, 273–274
quality indicators, 274
transabdominal ultrasonography (TUS), 217, 219
transbronchial needle aspiration (TBNA), 96, 102
failed, 97
nodal sampling, 105
transducers, 1, 2–6
beam pattern, 7
casing reverberation, 10
and lateral resolution, 7
properties affecting images, 6–7
transduodenal puncture, 250
transgastric puncture, 249–250
transrectal elastography, 68–69
treatment
 stage-based decisions, 119
therapeutic EUS, 239–247
tumor seeding
after FNA, 78–79
indeterminate biliary strictures, 208
TNM staging, 44–45,
ten tumors
 ablation of, 240–241
ampullary, 91
APUD, 140
carcinoid, 140–141, 232
cystic duct, 177
esophageal, 2
GI stromal, 139
granular cell, 141
intrapulmonary, 105, 108–109
invasion of, 165
mediastinal invasion (T4), 108–109
missed pancreatic, 154–155
mucin-producing, 91
obstructing, 120
overstaging, 11, 12
pancreatic, 239
neuroendocrine, 158
presenting as cysts, 177
solid, 45
solid pseudopapillary, 159
rectal, 227
stomal cell, 143–145
TNM staging, 44–45, 97
U
 ulcerative colitis, 233
ultrasound gastroscope, 286
ultrasound probes, catheter-based, 123
ultrasound (US)
 abdominal, 15
basic image types, 6
contrast agent (UCA), 10
contrast, 6, 8
frequency, 6, 8
high frequency (HFUS), 88
high frequency probes, see high-frequency ultrasound probes
images, 5
intraductal, see intraductal ultrasonography (IDUS)
miniprobes, 28–29
optimizing image quality in, 13
wavelength, 5–6
uninate process
mass in, 155
anterior, 52
radial EUS, 52
upstaging, avoidance in sampling, 106
V
 vagina, radial EUS, 53
varices, 142
bleeding, 268–269
gastric, 142
vascular interventions, with EUS, 288
vascular invasion, in pancreatic cancer, 164
venous anatomy, 152
venous compression, 165
venous encasement, partial, 164
venous interface loss, 164
venous invasion, in pancreatic cancer, 164
W
water-submersion, 47–48
wiring, labeling of, 31
World Health Organization, classification of pancreatic neoplasms, 151
Worth Boyce, H., 3