Cambridge University Press 978-0-521-88456-3 - Carcinoma of the Bladder Edited by David MacVicar Index More information

# Index

accelerated M-VAC chemotherapy, 130-131 see also CMV chemotherapy; gemcitabine/cisplatin (GC) chemotherapy; M-VAC chemotherapy adenocarcinoma imaging, 42-43 non-urachal, 43 pathology, 17-18 urachal, 18, 43 see also small cell (neuroendocrine) carcinoma; squamous cell carcinoma (SCC) adjuvant chemotherapy, 125, 129 see also neoadjuvant chemotherapy adriamycin (methotrexate, vinblastine, adriamycin, cisplatin) see M-VAC chemotherapy air-insufflation technique, 57 anastomosis Bricker, 101 uretero-intestinal, 100 Wallace, 101 Aristolochia fangchi, 24 avascular necrosis (AVN), 160 Bacille Calmette-Guérin (BCG), 28-29 benign papilloma, 12 benign tumors, 19 biopsy, transurethral resection, 147-148 bladder cancer chemotherapy for, 125-133 clinical features anatomical predisposition, 24 chemical aspects, 24 clinical presentation and initial management, 26-27 environmental aspects, 24 epidemiology, 23 etiology, 24-25 genetic predisposition, 25 staging and grading effects, 27-29 cystoscopy for, *see* cystoscopy follow-up, 137–143 imaging characteristics of histological subtypes, 41-48 clinical presentation and management, 31-32

diagnostic evaluation, 32-41 hematuria, 31 management in UK, 25-26 pathology, 1-21 adenocarcinoma, 17-18 benign and low malignant potential urothelial lesions, 12 benign tumors, 19 cancer type features, 5 diffuse or multifocal tumor, 5 etiology, 4 genetics and multifocality, 4 grading aspects, 5 histopathological approach, 4-12 inverted papilloma, 12 lymphovascular (LVSI) space invasion aspects, 5 metastatic cancer, 19 PUNLMP, 12 rare cancers, 19 renal pelvis and ureter, 19-20 small cell (neuroendocrine) carcinoma, 18-19 squamous cell carcinoma (SCC), 15-17 staging aspects, 5 TNM pathological staging, 5-8 urethral carcinomas, 20-21 urinary cytology aspects, 21 urothelial carcinoma and, 12-15 urothelial papilloma, 12 radiological staging, 51-74 surgery for, 93-103 cystectomy, 94-100 pelvic lymphadenectomy, 99 urethrectomy, 97-98 urinary diversion aspects, 100-103 TNM staging, 52 transurethral resection evaluation, 93 urothelial tumors, 2-3 WHO classification of urothelial tumors, 1-2 see also muscle invasive bladder cancer; superficial bladder cancer; urothelial carcinomas blue-light cystoscopy, 27

Cambridge University Press 978-0-521-88456-3 - Carcinoma of the Bladder Edited by David MacVicar Index More information

#### Index 175

bone metastases imaging, 84, 85, 86 see also metastatic bladder cancer Bricker anastomosis, 101 Bricker technique, 100 carboplatin, 132 see also chemotherapy carcinoma in situ (CIS), 5 pathology, 14-15 staging and grading effects, 28-29 see also urothelial carcinomas <sup>11</sup>C-choline PET, 73 <sup>11</sup>C-methionine PET, 73, 89 central nervous system (CNS) metastases imaging, 87 see also bone metastases; liver metastases; lung metastases; lymph node metastases chemoradiotherapy, 107-108 chemotherapy adjuvant, 125, 129 combination, 127 concurrent chemotherapy with radiotherapy, 128 intravesical, 153 neoadjuvant, 125-127 palliative, 129-131 patient care during, 132-133 regimens accelerated M-VAC, 126 CMV, 126 gemcitabine/cisplatin, 126 M-VAC, 126 residual masses evaluation following treatment, 161 systemic, 130 treated bladder cancer imaging and, 154-161 see also radiotherapy cisplatin based combination chemotherapy, 126-128 CMV chemotherapy regimen, 126 concurrent chemotherapy with radiotherapy and, 128 docetaxel/cisplatin (DC) trial, 131 gemcitabine and cisplatin (GC), 126, 131 M-VAC chemotherapy regimen, 126 palliative chemotherapy and, 131 see also methotrexate clinical target volume (CTV), 109-110 see also external beam radiotherapy CMV chemotherapy neoadjuvant, 126-127 see also accelerated M-VAC chemotherapy; cisplatin; gemcitabine/cisplatin (GC) chemotherapy; M-VAC chemotherapy combination chemotherapy accelerated M-VAC, 130 CMV, 130 docetaxel/cisplatin (DC), 131 gemcitabine and cisplatin (G/C), 131 M-VAC, 130-131 neoadjuvant, 127

platinum based, 127 see also single agent chemotherapy concurrent chemotherapy with radiotherapy, 128 conformal radiotherapy, 112 continent urinary diversion, 103 see also urinary diversion contrast-enhanced MRI, 58, 61, 67 for residual mass evaluation following treatment, 162 for treated bladder cancer, 155 for tumor recurrence patterns study, 166 CT (computed tomography), 35-37 comparison with MRI, 64, 65 follow-up imaging aspects, 88 for metastases imaging bone, 84 CNS, 87 liver, 83 lung, 84 lymph node, 81 ocular, 87 for residual mass evaluation following treatment, 161 for treated bladder cancer, 158-159 for tumor recurrence patterns study, 163, 168 radiological staging of bladder cancer and, 52-57 treated bladder cancer follow-up and, 169 virtual cystoscopy (VC), 40-41 see also MRI (magnetic resonance imaging); PET; ultrasound CT urography (CTU), 37-38 follow-up imaging aspects, 88 treated bladder cancer follow-up and, 169 see also imaging; IVU (intravenous urography); MR urography (MRU) cystectomy complications, 100 for muscle invasive bladder cancer, 94-100 in female, 95-96 in male, 95 nerve-sparing, 96-97 partial, 98 prostate-sparing, 98 radical, 148-153 salvage, 99 vagina-sparing, 97 see also external beam radiotherapy; pelvic lymphadenectomy; surgery; urethrectomy; urinary diversion cystoprostatectomy, radical, 94 cystoscopy blue-light, 27 flexible, 27 fluorescence, 33 rigid, 27, 33 superficial bladder cancer follow-up and, 137-138 treated bladder cancer follow-up and, 169 virtual, 40-41 see also imaging

Cambridge University Press 978-0-521-88456-3 - Carcinoma of the Bladder Edited by David MacVicar Index More information

### 176 Index

diffuse tumor, 5 distant metastases TNM pathological staging and renal pelvis and ureter, 6 urethra, 8 urinary bladder, 7 follow-up after radical surgery, 141 see also metastatic bladder cancer docetaxel/cisplatin (DC) trial, 131 see also chemotherapy dynamic contrast-enhanced MRI (DCE-MRI) for residual mass evaluation following treatment, 162 for tumor recurrence patterns study, 166 electrochemotherapy, 86 endoluminal ultrasonography (ELUS), 71-72 endometriosis, 45-46 excretory urography, 33-34 see also imaging external beam radiotherapy chemoradiotherapy, 107-108 conformal radiotherapy, 112 for muscle invasive bladder cancer treatment, 106-119 intensity-modulated radiotherapy (IMRT), 113 palliative radiotherapy, 117, 119 toxicity aspects, 117-118 treatment planning pathways clinical target volume (CTV), 109-110 dose and fractionation, 113-114 image-guided adaptive planning, 116-117 IMRT and conformal radiotherapy, 112 organ motion and treatment margins, 111-112 patient selection aspects, 108-109 treatment delivery and verification, 114-116 tumor localization, 111 see also chemotherapy; cystectomy FDG-PET, 72 follow-up imaging aspects, 89 tumor recurrence patterns study, 168 see also CT (computed tomography); MRI (magenetic rasonance imaging); ultrasound flat carcinoma in situ (CIS), 14 follow-up after radical radiotherapy, 143 imaging CT, 88 CT urography (CTU), 88 FDG-PET, 89 intravenous urography (IVU), 88 metastatic bladder cancer, 88-89 MR urography, 88 MRI, 88 PET-CT, 89 muscle invasive bladder cancer, 140-141 superficial bladder cancer cystoscopic follow-up, 137–138 high-risk, 138 intermediate-risk, 139

intravenous urography (IVU), 140 low-risk, 138 upper tract surveillance, 140 urine cytology, 139 treated bladder cancer, 169 urinary diversion consequences complications, 142 infections, 142 metabolic, 141-142 second malignancies, 143 fractionation, 113-114 hyperfractionation, 114 hypofractionation, 114 see also external beam radiotherapy gemcitabine/cisplatin (GC) chemotherapy palliative chemotherapy and, 131 regimen, 126 see also CMV chemotherapy; M-VAC chemotherapy glandular neoplasms, 2 grading effects on initial management, 27-29 systems, 5 see also staging granulocyte colony-stimulating factors (G-CSF), 130 see also chemotherapy gross tumor volume (GTV), 109 Hautman W reservoir, 102 see also urinary diversion hemopoietic tumors, 3 hepatic metastases imaging, 83-84 see also metastatic bladder cancer high-risk superficial bladder cancer follow-up, 138 human papillomavirus (HPV) infection, 20 hyperfractionation, 114 hypofractionation, 114 ileal conduit diversion, 100-101 see also urinary diversion imaging adenocarcinoma, 42-43 clinical presentation and management, 31-32 CT, 35-37 CTU, 37-38 endometriosis, 45-46 excretory urography, 33-34 hematuria, 31-32 lymphoma, 44-45 melanoma, 47 metastatic bladder cancer, 79-89 bone, 84-85 CNS, 87 cutaneous, 86 liver, 83 lung, 84 lymph node, 80-82

Cambridge University Press 978-0-521-88456-3 - Carcinoma of the Bladder Edited by David MacVicar Index More information

#### Index 177

ocular, 86 penile, 87 MRI, 38-39 MRU, 39 radionuclide, 34 retrograde studies, 34 SCC, 42 TCC, 42 treated bladder cancer chemotherapy and radiotherapy, 154-160 follow-up aspects, 169 imaging following surgery, 147-153 residual masses evaluation, 161-168 ultrasound, 34 urine cytology, 33 virtual cystoscopy (VC), 40-41 see also chemotherapy; external beam radiotherapy; radiological staging IMRT see intensity-modulated radiotherapy infections, urinary diversion follow-up and, 142 infiltrating urothelial carcinoma, 2 intensity-modulated radiotherapy (IMRT), 113 intermediate-risk superficial bladder cancer follow-up, 139 intravesical chemotherapy, 153 invasive carcinomas pathology, 13 see also urothelial carcinomas inverted papilloma, 12 isotope studies <sup>1</sup>C-choline PET, 73 <sup>11</sup>C-methionine PET, 73 <sup>18</sup>FDG-PET, 72 radiological staging of bladder cancer and, 72-74 see also imaging intravenous urography large bowel reservoirs, 102 see also urinary diversion IVU (intravenous urography), 33-34 follow-up imaging aspects, 88 superficial bladder cancer follow-up, 140 treated bladder cancer follow-up and, 169 see also CT urography (CTU); MR urography (MRU) liver metastases imaging, 83-84 see also bone metastases; lung metastases; lymph node metastases low-risk superficial bladder cancer follow-up, 138 see also high-risk superficial bladder cancer followup; intermediate-risk superficial bladder cancer follow-up lung metastases imaging, 84 see also metastatic bladder cancer lymph node metastases follow-up after radical surgery, 141

tumor recurrence patterns study, 166 see also bone metastases; liver metastases; lung metastases lymphadenectomy pelvic, 99 see also cystectomy lymphoma, 3, 44-45 lymphovascular (LVSI) space invasion, 5 Mainz 2 ureterosigmoidostomy, 103 melanocytic tumors, 2 melanoma, 47 mesenchymal tumors, 2 metastatic bladder cancer, 19 adenocarcinoma, 42 chemotherapy for, 129 imaging, 79 bone, 84-86 CNS, 87 cutaneous, 86 follow-up imaging aspects, 88-89 hepatic, 83-84 liver, 83-84 lung, 84 lymph node, 80-83 ocular, 86, 87 penile, 87 pathology, 19 methotrexate CMV (cisplatin, methotrexate and vinblastine) chemotherapy, 126-127 M-VAC (methotrexate, vinblastine, adriamycin, cisplatin) chemotherapy, 126-127, 130-131 see also cisplatin minimally invasive tumors, 13 see also muscle invasive bladder cancer; urothelial carcinomas Mitrofanoff principle, 103 see also urinary diversion MR urography (MRU) dynamic, 39 follow-up imaging aspects, 88 static, 39 see also CT urography (CTU); imaging; IVU (intravenous urography) MR virtual cystoscopy (VC), 40-41 MRI. 38-39 comparison with CT, 64-65 contrast-enhanced, 58, 61, 67 follow-up imaging aspects, 88 metastases imaging bone, 84 CNS, 87 lymph node, 81-82 ocular, 87 penile, 87 for residual mass evaluation following treatment, 161-162 for treated bladder cancer, 155-160

imaging, 80-83

Cambridge University Press 978-0-521-88456-3 - Carcinoma of the Bladder Edited by David MacVicar Index More information

### 178 Index

MRI (cont.) for tumor recurrence patterns study, 163, 165-166 radiological staging of bladder cancer and, 57-69 submucosal linear enhancement (SLE), 67-68 T1-weighted, 156, 159 T2-weighted, 58-61 for treated bladder cancer, 158-160 for residual mass evaluation following treatment, 161-162 for tumor recurrence patterns study, 165 treated bladder cancer follow-up and, 169 tumor recurrence patterns study, 168 MUC1 mucin, 73 multifocal tumor, 5 multileaf collimation (MLC), 112 see also external beam radiotherapy muscle invasive bladder cancer, 93 external beam radiotherapy for, 106-107 chemoradiotherapy, 107-108 clinical target volume (CTV) aspects, 109-110 dose and fractionation, 113-114 image-guided adaptive planning, 116-117 IMRT and conformal radiotherapy, 112 organ motion and treatment margins, 111 - 112palliative radiotherapy, 117, 119 patient selection aspects, 108-109 toxicity aspects, 117-118 treatment delivery and verification, 114-116 tumor localization aspects, 111 follow-up after radical surgery, 140-141 surgical management cystectomy, 94-100 male urethra management, 97 nerve-sparing cystectomy, 96-97 partial cystectomy, 98 pelvic lymphadenectomy, 99 prostate-sparing cystectomy, 98 salvage cystectomy, 99 urethrectomy, 97-98 urinary diversion aspects, 100-103 vagina-sparing cystectomy, 97 urinary diversion surgery and continent urinary diversion, 103 ileal conduit diversion, 100-101 large bowel reservoirs, 102 orthotopic reconstruction aspects, 101 small bowel reservoirs, 102 ureterosigmoidostomy, 102-103 see also superficial bladder cancer; urothelial carcinomas M-VAC chemotherapy neoadjuvant, 127 palliative, 130-131 see also accelerated M-VAC chemotherapy; CMV chemotherapy; gemcitabine/cisplatin (GC) chemotherapy

neoadjuvant chemotherapy, 125-127 cisplatin-based combination, 127 CMV, 126-127 M-VAC, 127 see also adjuvant chemotherapy nerve-sparing cystectomy, 97 see also prostate-sparing cystectomy; vagina-sparing cystectomy nerve-sparing radical prostatectomy, 98 neuroendocrine tumors, 2, 18 noninvasive tumors, 2, 13 see also urothelial carcinomas non-urachal adenocarcinoma, 43 see also urachal adenocarcinoma ocular metastases imaging, 86, 87 see also metastatic bladder cancer orthotopic bladder reconstructions, 151 treated bladder cancer imaging and, 149 urinary diversion and, 101 see also surgery paclitaxel, 131 palliative chemotherapy, 129-131 accelerated M-VAC chemotherapy and, 130 - 131M-VAC chemotherapy and, 130-131 palliative radiotherapy, 117, 119 see also external beam radiotherapy papillary urothelial carcinoma non-invasive, 13 PUNLMP, 12 partial cystectomy, 98 pelvic hematomas, 150-151 lymph nodes metastases, 167 lymphadenectomy, 99 renal pelvis and ureter reporting proforma for, 10 TNM pathological staging, 6 tumor pathology, 19-20 tissues, chemotherapy and radiotherapy effects on, 156-160 penile metastases imaging, 87 see also metastatic bladder cancer PET <sup>11</sup>C-choline PET, 73 <sup>11</sup>C-methionine PET, 73 <sup>18</sup>FDG-PET, 72 see also CT (computed tomography); MRI (magnetic resonance imaging) PET-CT follow-up imaging aspects, 89 for bone metastases imaging, 84-85 for liver metastases imaging, 83 planning target volume (PTV), 112 see also external beam radiotherapy

Cambridge University Press 978-0-521-88456-3 - Carcinoma of the Bladder Edited by David MacVicar Index More information

#### Index 179

primary tumor (TNM pathological staging aspects) renal pelvis and ureter, 6 urethra, 7 urinary bladder, 6 prophylactic urethrectomy, 97 prostatectomy, nerve-sparing radical, 98 prostate-sparing cystectomy, 98 prostatic carcinoma imaging, 47 prostatic urethra, 8 PUNLMP (papillary urothelial neoplasms of low malignant potential), 12 radical cystectomy complications, 100 treated bladder cancer imaging and, 148-153 see also radical radiotherapy; surgery radical cystoprostatectomy, 94 radical radiotherapy, 106 follow-up after, 143 side effects, 117-118 see also external beam radiotherapy; radical cystectomy; radiotherapy radical surgery, 140-141 radiological staging, 51 <sup>11</sup>C-methionine PET, 73 CT, 52–57 <sup>18</sup>FDG-PET, 72–73 isotope studies, 72-74 MRI, 57-69 ultrasound, 69-72 see also imaging radionuclide imaging, 34 radiotherapy, 125 chemoradiotherapy, 107-108 concurrent chemotherapy with, 128 conformal, 112 external beam, 106-119 for ocular metastases imaging, 87 intensity-modulated radiotherapy (IMRT), 113 palliative, 117, 119 radical, see radical radiotherapy residual masses evaluation following treatment, 161, 163 treated bladder cancer imaging and, 154-161 see also chemotherapy rare bladder malignancies, 19 recurrence patterns, tumor, 163-168 see also treated bladder cancer imaging regional lymph nodes (TNM pathological staging aspects) renal pelvis and ureter, 6 urethra, 8 urinary bladder, 7 renal pelvis and ureter reporting proforma for, 10 TNM pathological staging, 6 tumor pathology, 19, 20 see also pelvic

residual mass evaluation following cancer treatment, 161-168 dynamic contrast-enhanced MRI, 162 tumor recurrence patterns, 163-168 see also treated bladder cancer imaging retinoblastoma gene, 25 retrograde studies, 34 rigid cystoscopy, 27, 33 salvage cystectomy, 99 Schistosoma haematobium, 17, 24, 17 single agent chemotherapy, 130 see also combination chemotherapy small bowel reservoirs, 102 see also urinary diversion small cell (neuroendocrine) carcinoma pathology, 18-19 see also adenocarcinoma smoking, bladder cancer risk and, 24 squamous cell carcinoma (SCC) imaging, 42 pathology, 15-17 see also adenocarcinoma; urothelial carcinomas squamous neoplasms, 2 staging effects on initial management, 27-29 radiological, 51-74 TNM, 5-8, 52-53 renal pelvis and ureter, 6 urethra, 7-8 urinary bladder, 6-7 see also grading STIR, 159 Studer J-reservoir, 102 see also urinary diversion submucosal linear enhancement (SLE), 67-68 see also MRI (magnetic resonance imaging) superficial bladder cancer, 13-14 cystoscopic follow-up, 137, 138 high-risk cancer follow-up, 138 intermediate-risk cancer follow-up, 139 IVU follow-up, 140 low-risk cancer follow-up, 138 urine cytology follow-up, 139 see also muscle invasive bladder cancer; urothelial carcinomas surgerv for muscle invasive bladder cancer, 93-103 cystectomy, 94-99 follow-up after radical surgery, 140-141 nerve-sparing cystectomy, 96 partial cystectomy, 98 pelvic lymphadenectomy, 99 prostate-sparing cystectomy, 98 salvage cystectomy, 99 urethrectomy, 97 urinary diversion, 100-103 vagina-sparing cystectomy, 97 imaging following

Cambridge University Press 978-0-521-88456-3 - Carcinoma of the Bladder Edited by David MacVicar Index More information

#### 180 Index

surgery (cont.) muscle invasive bladder cancer, 140-141 radical cystectomy, 148-153 transurethral resection and biopsy, 147-148 systemic chemotherapy, 130 for cutaneous metastases, 86 for ocular metastases, 87 T1/T2-weighted MRI, see under MRI (magnetic resonance imaging) TCC see transitional cell carcinoma TNM staging, 5-8, 52-53 renal pelvis and ureter, 6 urethra, 7-8 urinary bladder, 6-7 see also grading toxicity, radical radiotherapy and, 117-118 transitional cell carcinoma (TCC), 1 imaging, 42 of prostate, 8 tumor recurrence patterns study, 166 transrectal ultrasound, 69 transurethral resection (TUR) biopsy and, 147, 148 cancer follow-up aspects, 137 surgery and, 93 transurethral resection of bladder tumor (TURBT), 4, 147 transurethral ultrasonography (TUUS), 70-72 transvaginal ultrasound, 69 treated bladder cancer imaging chemotherapy and radiotherapy effects on normal pelvic tissues, 156-160 effects on tumor and response evaluation, 154-155 follow-up aspects, 147, 169 intravesical chemotherapy, 153 radical cystectomy, 148-153 residual masses evaluation, 161-168 transurethral resection and biopsy, 147-148 ultra-small superparamagnetic iron oxide particles (USPIO), 82 see also imaging ultrasonography endoluminal (ELUS), 71-72 transurethral (TUUS), 70-72 ultrasound, 34 endoluminal (ELUS), 71-72 for penile metastases imaging, 87 radiological staging of bladder cancer and, 69-72 transrectal, 69 transurethral (TUUS), 70-72 transvaginal, 69 see also CT (computed tomography); imaging; MRI (magnetic resonance imaging); PET United Kingdom, bladder cancer management in, 25 - 26upper tract surveillance, 140 see also follow-up

urachal adenocarcinoma, 18 imaging, 43 see also adenocarcinoma ureter see renal pelvis and ureter uretero-intestinal anastomosis, 100 ureterosigmoidostomy for muscle invasive bladder cancer, 102-103 Mainz 2, 103 see also urethrectomy; urinary diversion; urography urethra prostatic, 8 reporting proforma for, 11 TNM pathological staging, 7-8 tumor pathology, 20-21 urethrectomy female urethra, 97 for muscle invasive bladder cancer, 97-98 male urethra, 97 prophylactic, 97 see also cystectomy; ureterosigmoidostomy; urography urinary diversion cancer follow-up aspects of infections, 142 metabolic urinary diversion consequences, 141-142 second malignancies, 143 urinary diversion complications, 142 continent, 103 ileal conduit, 100-101 large bowel reservoirs and, 102 Mitrofanoff principle, 103 muscle invasive bladder cancer and, 100-103 orthotopic reconstruction and, 101 small bowel reservoirs and, 102 ureterosigmoidostomy, 102-103 see also cystectomy; surgery urine cytology, 21, 33 superficial bladder cancer follow-up, 139 see also imaging urography CT (CTU), 37-38, 88 excretory, 33-34 intravenous (IVU), 88 MR (MRU), 39, 88 see also ureterosigmoidostomy; urethrectomy urothelial carcinomas, 1 glandular neoplasms, 2 hemopoietic, 3 infiltrating, 2 lymphoid, 3 melanocytic, 2 mesenchymal, 2 neuroendocrine, 2 non-invasive, 2, 13 pathology, 12 carcinoma in situ (CIS), 14-15 invasive carcinomas, 13

Cambridge University Press 978-0-521-88456-3 - Carcinoma of the Bladder Edited by David MacVicar Index More information

#### Index 181

minimally invasive tumors, 13 non-invasive tumors, 13 variants of carcinoma, 15 genetics and multifocality, 4 papillary, 12 squamous, 2 *see also* squamous cell carcinoma (SCC) urothelial papilloma, 12 urothelium, 1

vagina-sparing cystectomy, 97 see also nerve-sparing cystectomy; prostate-sparing cystectomy vinblastine CMV (cisplatin, methotrexate and vinblastine) chemotherapy, 126–127 M-VAC (methotrexate, vinblastine, adriamycin, cisplatin) chemotherapy, 126–127, 130–131 virtual cystoscopy (VC) CT, 40–41 MR, 40–41 see also imaging

Wallace anastomosis, 101 WHO classification (urothelial tumors), 1–2