

SCHWERPUNKT: NEUROENDOKRINE TUMOREN

Chirurgische Behandlung von typischen und atypischen neuroendokrinen Tumoren der Lunge (S. 10–14)

A. Kirschbaum

1. Hendifar AE, Marchevsky AM, and Tuli R. Neuroendocrine Tumors of the Lung: Current Challenges and Advances in the Diagnosis and Management of Well-Differentiated Disease. *J Thorac Oncol* 2017; 12(3): 425–436
2. Caplin ME et al. Pulmonary neuroendocrine (carcinoid) tumors: European Neuroendocrine Tumor Society expert consensus and recommendations for best practice for typical and atypical pulmonary carcinoids. *Ann Oncol* 2015; 26(8): 1604–20
3. Naalsund A et al. Carcinoid lung tumors – incidence, treatment and outcomes: a population-based study. *Eur J Cardiothorac Surg* 2011; 39(4): 565–9
4. Davini F et al. Typical and atypical carcinoid tumours: 20-year experience with 89 patients. *J Cardiovasc Surg (Torino)* 2009; 50(6): 807–11
5. Van Schil P et al. Sleeve resection for bronchial carcinoid tumors: results in 13 patients with an average follow-up of 6 years. *Acta Chir Belg* 1991; 91(3): 131–5
6. Noel-Savina E and Descourt R. Focus on treatment of lung carcinoid tumor. *Onco Targets Ther* 2013; 6: 1533–7
7. Luckraz H et al. Long-term outcome of bronchoscopically resected endobronchial typical carcinoid tumors. *J Thorac Cardiovasc Surg* 2006; 132(1): 113–5
8. Chassagnon G, Bennani S, and Revel MP. New TNM classification of non-small cell lung cancer. *Rev Pneumol Clin* 2017; 73(1): 34–39
9. Mountain CF. The international system for staging lung cancer. *Semin Surg Oncol* 2000; 18(2): 106–15
10. Watanabe S. Lymph node dissection for lung cancer: past, present, and future. *Gen Thorac Cardiovasc Surg* 2014; 62(7): 407–14
11. Ko JP et al. CT depiction of regional nodal stations for lung cancer staging. *AJR Am J Roentgenol* 2000; 174(3): 775–82
12. Fazio N et al. Everolimus in advanced, progressive, well-differentiated, non-functional neuroendocrine tumors: RADIANT-4 lung subgroup analysis. *Cancer Sci* 2018; 109(1): 174–181
13. Oberg K and Jelic S. Neuroendocrine bronchial and thymic tumors: ESMO clinical recommendation for diagnosis, treatment and follow-up. *Ann Oncol* 2008; 19 Suppl 2: ii102–3

Duodenale und ampulläre neuroendokrine Neoplasien (S. 16–24)

A. Nießen, S. Schimmack, O. Strobel

1. Musholt TJ, Watzka FM. Neuroendokrine Neoplasien des gastroenteropankreatischen Systems. *Der Gastroenterologe* 2015; 10: 410–417
2. Modlin IM, Oberg K, Chung DC, Jensen RT, de Herder WW, Thakker RV, et al. Gastroenteropancreatic neuroendocrine tumours. *Lancet Oncol* 2008; 9: 61–72
3. O’Shea T, Druce M. When should genetic testing be performed in patients with neuroendocrine tumours? *Rev Endocr Metab Disord* 2017; 18: 499–515

4. Fendrich V, Langer P, Waldmann J, Bartsch DK, Rothmund M. Management of sporadic and multiple endocrine neoplasia type 1 gastrinomas. *Br J Surg* 2007; 94: 1331–1341
5. Falconi M, Eriksson B, Kaltsas G, Bartsch DK, Capdevila J, Caplin M, et al.; Vienna Consensus Conference participants. ENETS Consensus Guidelines Update for the Management of Patients with Functional Pancreatic Neuroendocrine Tumors and Non-Functional Pancreatic Neuroendocrine Tumors. *Neuroendocrinology* 2016; 103: 153–171
6. Yao JC, Hassan M, Phan A, Dagohoy C, Leary C, Mares JE, et al. One hundred years after „carcinoid“: epidemiology of and prognostic factors for neuroendocrine tumors in 35,825 cases in the United States. *J Clin Oncol* 2008; 26: 3063–3072
7. Modlin IM, Lye KD, Kidd M. A 5-decade analysis of 13,715 carcinoid tumors. *Cancer* 2003; 97: 934–959
8. Holzer K. Gastroenteropancreatic neuroendocrine tumors: targeted diagnostics and therapy. *Chirurg* 2014; 85: 731–744
9. Vanoli A, La Rosa S, Klersy C, Grillo F, Albarello L, Inzani F, et al. Four Neuroendocrine Tumor Types and Neuroendocrine Carcinoma of the Duodenum: Analysis of 203 Cases. *Neuroendocrinology* 2017; 104: 112–125
10. Delle Fave G, Kwekkeboom DJ, Van Cutsem E, Rindi G, Kos-Kudla B, Knigge U, et al. ENETS Consensus Guidelines for the management of patients with gastroduodenal neoplasms. *Neuroendocrinology* 2012; 95: 74–87
11. Delle Fave G, O’Toole D, Sundin A, Taal B, Ferolla P, Ramage JK, et al. ENETS Consensus Guidelines Update for Gastroduodenal Neuroendocrine Neoplasms. *Neuroendocrinology* 2016; 103: 119–124
12. Deutsche Gesellschaft für Gastroenterologie, Verdauungs- und Stoffwechselkrankheiten (DGVS), et al. Practice guideline neuroendocrine tumors - AWMF-Reg. 021-27. *Z Gastroenterol* 2018; 56: 583–681
13. Wittekind C, Hrsg. TNM: Klassifikation maligner Tumoren. 8. Aufl. Weinheim: Wiley; 2017
14. Lee I, Paeng JC, Lee SJ, Shin CS, Jang JY, Cheon GJ, et al. Comparison of Diagnostic Sensitivity and Quantitative Indices Between (68)Ga-DOTATOC PET/CT and (111)In-Pentetretotide SPECT/CT in Neuroendocrine Tumors: a Preliminary Report. *Nucl Med Mol Imaging* 2015; 49: 284–290
15. Sainz-Esteban A, Olmos R, González-Sagrado M, González ML, Ruiz MA, García-Talavera P, et al. Contribution of 111In-pentetretotide SPECT/CT imaging to conventional somatostatin receptor scintigraphy in the detection of neuroendocrine tumours. *Nucl Med Commun* 2015; 36: 251–259
16. Maxwell JE, Howe JR. Imaging in neuroendocrine tumors: an update for the clinician. *Int J Endocr Oncol* 2015; 2: 159–168
17. Gincul R, Ponchon T, Napoleon B, Scoazec JY, Guillaud O, Saurin JC, et al. Endoscopic treatment of sporadic small duodenal and ampullary neuroendocrine tumors. *Endoscopy* 2016; 48: 979–986
18. Fendrich V, Bartsch DK. Surgical approach of gastroduodenal neuroendocrine neoplasms. *Chirurg* 2016; 87: 280–287
19. Min BH, Kim ER, Lee JH, Kim KM, Min YW, Rhee PL, et al. Management strategy for small duodenal carcinoid tumors: does conservative management with close follow-up represent an alternative to endoscopic treatment? *Digestion* 2013; 87: 247–253
20. Kim SH, Park CH, Ki HS, Jun CH, Park SY, Kim HS, et al. Endoscopic treatment of duodenal neuroendocrine tumors. *Clin Endosc* 2013; 46: 656–661
21. Margonis GA, Samaha M, Kim Y, Postlewait LM, Kunz P, Maithel S, et al. A Multi-institutional Analysis of Duodenal Neuroendocrine Tumors: Tumor Biology Rather than Extent of Resection Dictates Prognosis. *J Gastrointest Surg* 2016; 20: 1098–1105
22. Dogeas E, Cameron JL, Wolfgang CL, Hirose K, Hruban RH, Makary MA, et al. Duodenal and Ampullary Carcinoid Tumors: Size Predicts Necessity for Lymphadenectomy. *J Gastrointest Surg* 2017; 21: 1262–1269
23. Hackert T, Büchler MW, Werner J. Current state of surgical management of pancreatic cancer. *Cancers (Basel)* 2011; 3: 1253–1273

24. Diener MK, Fitzmaurice C, Schwarzer G, Seiler CM, Hüttner FJ, Antes G, et al. Pylorus-preserving pancreaticoduodenectomy (pp Whipple) versus pancreaticoduodenectomy (classic Whipple) for surgical treatment of periampullary and pancreatic carcinoma. *Cochrane Database Syst Rev* 2014; (11): CD006053
25. Kwekkeboom DJ, Krenning EP, Lebtahi R, Komminoth P, Kos-Kudla B, de Herder WW, et al.; European Neuroendocrine Tumor Society. ENETS Consensus Guidelines for the Standards of Care in Neuroendocrine Tumors: peptide receptor radionuclide therapy with radiolabeled somatostatin analogs. *Neuroendocrinology* 2009; 90: 220–226
26. Iwasaki T, Nara S, Kishi Y, Esaki M, Shimada K, Hiraoka N. Surgical treatment of neuroendocrine tumors in the second portion of the duodenum: a single center experience and systematic review of the literature. *Langenbecks Arch Surg* 2017; 402: 925–933
27. Hatta W, Koike T, Iijima K, Asanuma K, Asano N, Musha H, et al. The Risk Factors for Metastasis in Non-Ampullary Duodenal Neuroendocrine Tumors Measuring 20 mm or Less in Diameter. *Digestion* 2017; 95: 201–209.
28. Okubo Y, Yokose T, Motohashi O, Miyagi Y, Yoshioka E, Suzuki M, et al. Duodenal Rare Neuroendocrine Tumor: Clinicopathological Characteristics of Patients with Gangliocytic Paraganglioma. *Gastroenterol Res Pract* 2016; 2016: 5257312
29. Li B, Li Y, Tian XY, Luo BN, Li Z. Malignant gangliocytic paraganglioma of the duodenum with distant metastases and a lethal course. *World J Gastroenterol* 2014; 20: 15454–15461
30. Cathcart SJ, Sasson AR, Kozel JA, Oliveto JM, Ly QP. Duodenal gangliocytic paraganglioma with lymph node metastases: A case report and comparative review of 31 cases. *World J Clin Cases* 2017; 5: 222–233
31. Büchler M, Malfertheiner P, Baczako K, Krautzberger W, Beger HG. A metastatic endocrine-neurogenic tumor of the ampulla of Vater with multiple endocrine immunoreaction - malignant paraganglioma. *Digestion* 1985; 31: 54–59
32. Hain E, Coriat R, Dousset B, Gaujoux S. Management of gastrinoma. *Presse Med* 2016; 45: 986–991
33. Lopez CL, Falconi M, Waldmann J, Boninsegna L, Fendrich V, Goretzki PK, et al. Partial pancreaticoduodenectomy can provide cure for duodenal gastrinoma associated with multiple endocrine neoplasia type 1. *Ann Surg* 2013; 257: 308–314
34. Guarnotta V, Martini C, Davì MV, Pizza G, Colao A, Faggiano A; NIKE group. The Zollinger-Ellison syndrome: is there a role for somatostatin analogues in the treatment of the gastrinoma? *Endocrine* 2018; 60: 15–27
35. Randle RW, Ahmed S, Newman NA, Clark CJ. Clinical outcomes for neuroendocrine tumors of the duodenum and ampulla of Vater: a population-based study. *J Gastrointest Surg* 2014; 18: 354–362
36. Untch BR, Bonner KP, Roggin KK, Reidy-Lagunes D, Klimstra DS, Schattner MA, et al. Pathologic grade and tumor size are associated with recurrence-free survival in patients with duodenal neuroendocrine tumors. *J Gastrointest Surg* 2014; 18: 457–462; discussion 462–463
37. Dumitrascu T, Dima S, Herlea V, Tomulescu V, Ionescu M, Popescu I. Neuroendocrine tumours of the ampulla of Vater: clinico-pathological features, surgical approach and assessment of prognosis. *Langenbecks Arch Surg* 2012; 397: 933–943

Das Merkelzellkarzinom – ein Fallbeispiel und eine Literaturübersicht (S. 33–36)

S. Schmücker, S. Gattenlöhner, R. Kraus

1. Eisemann N, Waldmann A, Geller AC, Weinstock MA, Volkmer B, Greinert R, et al. Non-melanoma skin cancer incidence and impact of skin cancer screening on incidence. *J Invest Dermatol* 2014; 134: 43–50

2. Starz H, Seegenschmiedt MH, Ulrich M, Stockfleth E. Seltene Hauttumoren. *Onkologe* 2009; 15: 292–301
3. Toker C. Trabecular carcinoma of the skin. *Arch Dermatol* 1972; 105: 107–110
4. Sauer CM, Chteinberg E, Rennspiess D, Kurz AK, zur Hausen A. Merkelzellkarzinom: kutane Manifestation einer hochmalignen Prä-/pro-B-Zell-Neoplasie? Neues Konzept zum zellulären Ursprung des Merkelzellkarzinoms. *Hautarzt* 2017; 68: 204–210
5. Feng H, Shuda M, Chang Y, Moore PS. Clonal integration of a polyomavirus in human Merkel cell carcinoma. *Science* 2008; 319: 1096–1100
6. Siegmund-Schultze N. Onkogenese: Unter Verdacht – wie sich neue Tumorstoffe identifizieren lassen. *Dtsch Arztebl* 2017; 114: 14
7. Moore PS, Chang Y. The conundrum of causality in tumor virology: the cases of KSHV and MCV. *Seminars in Cancer Biology* 2014; 26: 4–12
8. Agelli M, Clegg LX, Becker JC, Rollison DE. The etiology and epidemiology of Merkel cell carcinoma. *Curr Probl Cancer* 2010; 34: 14–37
9. Zwald FO, Brown M. Skin cancer in solid organ transplant recipients: advances in therapy and management: part I. Epidemiology of skin cancer in solid organ transplant recipients. *J Am Acad Dermatol* 2011; 65: 253–261
10. Schadendorf D, Lebbé C, zur Hausen A, Avril MF, Hariharan S, Bharmal M, et al. Merkel cell carcinoma: Epidemiology, prognosis, therapy and unmet medical needs. *Eur J Cancer* 2017; 71: 53–69
11. Becker JC, Assaf C, Vordermark D, Reske SN, Hense J, Dettenborn T, et al. S2k – Kurzleitlinie - Merkelzellkarzinom (MCC, kutanes neuroendokrines Karzinom) – Update 2012. AWMF online 2012. (https://www.helios-gesundheit.de/fileadmin/UWS_Kliniken/Klinikum_Wuppertal/Hautkrebszentrum/032-023l_S2k_Merkelzellkarzionom_2012-03.pdf). (https://www.helios-gesundheit.de/fileadmin/UWS_Kliniken/Klinikum_Wuppertal/Hautkrebszentrum/032-023l_S2k_Merkelzellkarzionom_2012-03.pdf). Zugegriffen: 17.06.2019
12. Heath M, Jaimes N, Lemos B, Mostaghimi A, Wang LC, Penas PF, et al. Clinical characteristics of Merkel cell carcinoma at diagnosis in 195 patients: the AEIOU features. *J Am Acad Dermatol* 2008; 58: 375–381
13. Andea AA, Coit DG, Amin B, Busam KJ. Merkel cell carcinoma: histologic features and prognosis. *Cancer* 2008; 113: 2549–2558
14. Lemos BD, Storer BE, Iyer JG, Phillips JL, Bichakjian CK, Fang LC, et al. Pathologic nodal evaluation improves prognostic accuracy in Merkel cell carcinoma: analysis of 5823 cases as the basis of the first consensus staging system. *J Am Acad Dermatol* 2010; 63: 751–761
15. Edge S, Byrd DR, Compton CC, Fritz AG, Greene FL, Trotti A. *AJCC Cancer Staging Manual*. New York: Springer; 2010
16. National Comprehensive Cancer Network®. *CCN Clinical Practice Guidelines in Oncology: Merkel Cell Carcinoma*. 2017. (<https://www.merkelcell.org/wp-content/uploads/2017/11/NCCN-Evidence-Blocks-Clinical-Practice-Guidelines-In-Oncology-Merkel-Cell-Carcinoma-Version-1.2018-October-6-2017.pdf>). Zugegriffen: 17.06.2019
17. Foote M, Harvey J, Porceddu S, Dickie G, Hewitt S, Colquist S, et al. Effect of radiotherapy dose and volume on relapse in Merkel cell cancer of the skin. *Int J Radiat Oncol Biol Phys* 2010; 77: 677–684
18. Mortier L, Mirabel X, Fournier C, Piette F, Lartigau E. Radiotherapy alone for primary Merkel cell carcinoma. *Arch Dermatol* 2003; 139: 1587–1590