Unusual endoscopic appearance of B-cell lymphoma of the small bowel in a patient with Crohn's disease: a case report

Martina Pintérová Kolesárová[1], Marcela Kopáčová[1], Věra Tyčová[2], David Belada[1], Lukáš Smolej[1], Jan Krejsek[3], Michal Pintér[1], Stanislav Rejchrt[1], Jan Bureš[1]

[1] 2nd Department of Medicine, Charles University in Praha, Faculty of Medicine at Hradec Králové, University Teaching Hospital, Hradec Králové, Czech Republic

[2] The Fingerland Department of Pathology, Charles University in Praha, Faculty of Medicine at Hradec Králové, University Teaching Hospital, Hradec Králové, Czech Republic

[3] Institute of Clinical Immunology and Allergology, Charles University in Praha, Faculty of Medicine at Hradec Králové, University Teaching Hospital, Hradec Králové, Czech Republic

Pintérová Kolesárová M, Kopáčová M, Tyčová V, Belada D, Smolej L, Krejsek J, Pintér M, Rejchrt S, Bureš J. Unusual endoscopic appearance of B-cell lymphoma of the small bowel in a patient with Crohn's disease: a case report. Folia Gastroenterol Hepatol 2005; 3 (3): 104 – 109.

Abstract. *The case report of a 42-year-old man describes MALT type B-cell lymphoma of the jejunum in Crohn's disease (lasting 10 years) presented with quite unusual endoscopic appearance. The patient was treated with azathioprine for 3 last years. Both Ebstein-Barr and cytomegalovirus were negative. A 3-centimetre long segment of pathological appearance of the bowel was found in the proximal jejunum, transverse folds were swollen, no villi were present and pathological tumorous vascularization was seen. The risk of lymphoma in inflammatory bowel disease is low in general. This case report shows gastroenterologists the possible unusual enteroscopic appearance of jejunal lymphoma.*

Key words: *Crohn's disease, MALT type B-cell lymphoma, jejunum, enteroscopy, tumorous neo-vascularization*

Pintérová Kolesárová M, Kopáčová M, Tyčová V, Belada D, Smolej L, Krejsek J, Pintér M, Rejchrt S, Bureš J. Neobvyklý endoskopický obraz B-buněčného lymfomu tenkého střeva u nemocného s Crohnovou chorobou: kazuistika. Folia Gastroenterol Hepatol 2005; 3 (3): 104 – 109.

Souhrn. *Kazuistika popisuje neobvyklý endoskopický vzhled MALT B-lymfomu jejuna u 42-letého muže s Crohnovou chorobou trvající deset let. Pacient byl léčený azathioprinem tři roky. Infekce virem Ebstein Barrové a cytomegalovirem byla negativní. Při endoskopickém vyšetření byl v proximálním jejunu nalezen 3 cm dlouhý segment patologického vzhledu. Příčné řasy byly oteklé, postižené místo bylo bez střevních klků a byla patrná patologická vaskularizace. Riziko vzniku lymfomu u pacientů s idiopatickým střevním zánětem je nízké. Tato kazuistika ukazuje gastroenterologům možný neobvyklý endoskopický vzhled jejunálního lymfomu.*

Klíčová slova: *Crohnova choroba, MALT B-lymfom, jejunum, enteroskopie, nádorová neo-vaskularizace*

The gastrointestinal tract is the predominant site of extranodal non-Hodgkin's lymphomas. Primary non-Hodgkin's lymphomas of the gastrointestinal tract are rare, accounting for only 1 to 4 percent of malig-

nancies arising in the stomach, small intestine, or colon. B-cell lymphomas of the MALT type (Mucosa Associated Lymphoid Tissue-type lymphoma), now called extranodal marginal zone B-cell lymphoma of MALT type in the WHO classification, are the most common primary gastrointestinal lymphomas (46), comprising about 35 % cases (29). This low-grade MALT type lymphoma usually has a favourable prognosis among other primary small intestinal lymphomas (37). The distal small bowel, particularly the ileocaecal region, is a more frequent site of its involvement than the proximal small intestine or colon (16,19,20,42).

An association between inflammatory bowel disease and lymphoma has been described in several reports (17,26,31,47,50). Large population-based studies have found relative risks ranging from 0.4 to 2.4 (4,12,25,32,35,38,40).

Primary small intestinal lymphomas of the MALT type may be present as unifocal (or less commonly multifocal) ulcerated, protruding, or infiltrating mass lesions (44,46). Endoscopic features of small intestinal lymphoma usually comprise infiltration of the intestinal wall, affected segment is rigid, reddish, fragile and often bleeding spontaneously. Intestinal folds are smooth and no peristalsis is apparent. In MALT type lymphoma, irregular nodular or polypoid pattern is seen and multiple ulcers with scaring could be found (5,18,51,54).

We describe a case of MALT type B-cell lymphoma in a patient with Crohn's disease presented with quite unusual endoscopic appearance.

Case report

A 42-year-old man presented elsewhere with abdominal pain and diarrhoea in 1995. Because of these complaints he underwent appendectomy laparoscopically in July 1996, histology revealed non-specific chronic inflammatory changes. Further investigation was carried out for melaena which occurred in February 1997. Infiltration of duodenal mucosa in gastroduodenoscopy and non-specific proctitis in colonoscopy were found. The patient was referred to our Department in April 1997 and diagnosis of Crohn's disease was established (based on gastroduodenoscopy, push-enteroscopy, colonoscopy and histology of biopsy specimens). Benign spinocellular papiloma of the distal oesophagus was removed endoscopically as an accidental finding in a heavy smoker. Treatment with mesalazine (5-aminosalicylic acid) was started. The patient gained weight of 6 kg (previously lost) and stayed symptom-free for the following four years. A flare-up of Crohn's disease occurred in March 2001, presented with abdominal colicky pain. Segmental

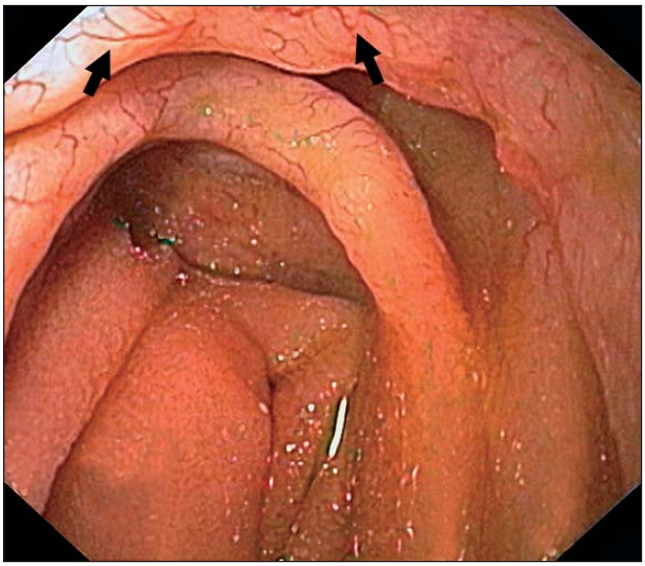

Figure 1 / Obr. 1
Low grade B-cell MALT lymphoma complicating Crohn's disease. The folds are swollen, no villi present, mucosa is fragile with pathological vascularization (arrows). On the top of the folds are multiple erosions. Enteroscopy, proximal jejunum.
MALT lymfom (low grade B-lymfom) komplikující Crohnovu chorobu. Slizniční řasy jsou oteklé, bez klků, sliznice je křehká s patologickou vaskularizací (šipky). Na vrcholcích řas jsou patrné drobné eroze. Enteroskopie, proximální jejunum.

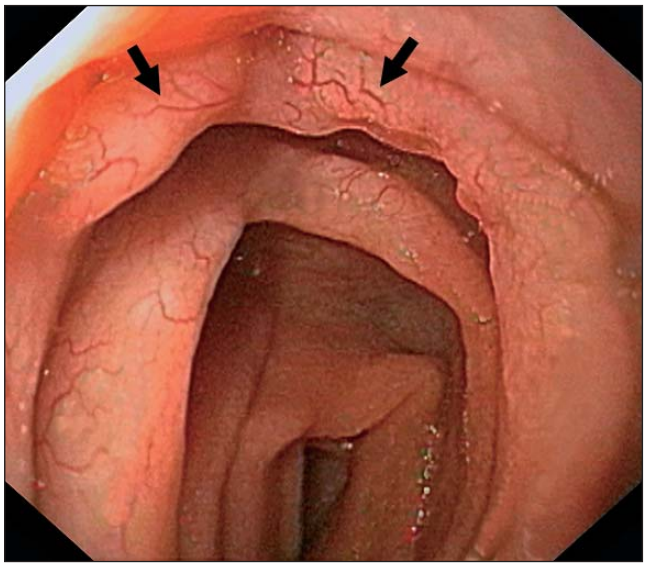

Figure 2 / Obr. 2
Low grade B-cell MALT lymphoma complicating Crohn's disease. Abnormal tumorous neo-vascularization (arrows) is shown. Enteroscopy, proximal jejunum.
MALT lymfom (low grade B-lymfom) komplikující Crohnovu chorobu. Je patrná abnormální nádorová neo-vaskularizace (šipky). Enteroskopie, proximální jejunum.

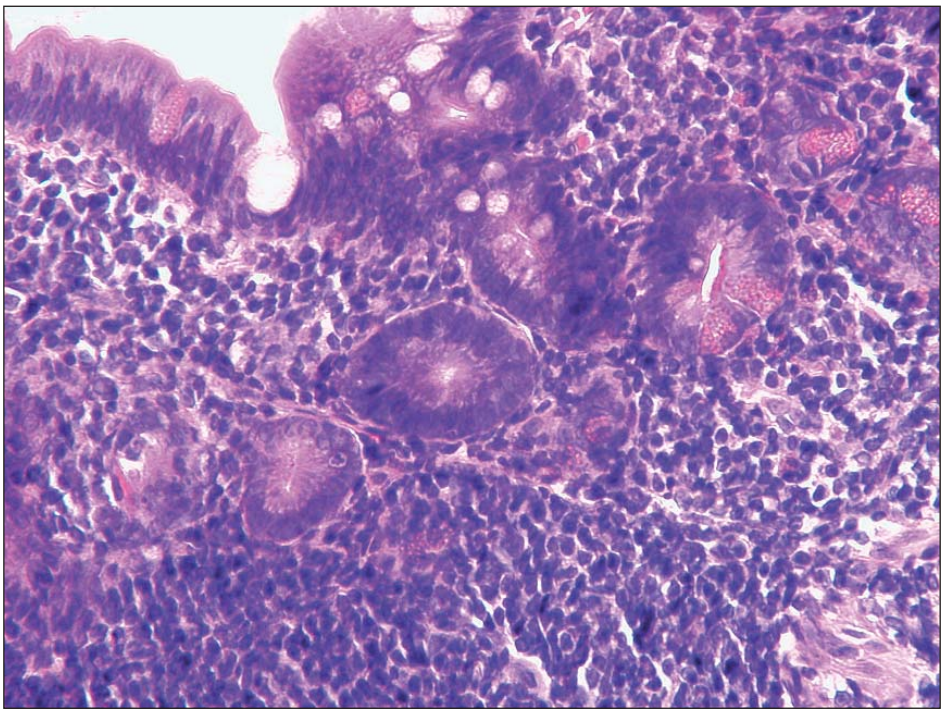

Figure 3 / Obr. 3
Low grade B-cell MALT lymphoma. Infiltration of the lamina propria mucosae by the tumour lymphoid cells in the jejunum. Haematoxyllin-eosin, magnification 100x.
Infiltrace sliznice jejuna lymfoidním buňkami pocházejícími z MALT lymfomu (low grade B-lymfom). Hematoxylin-eozin, zvětšení 100x.

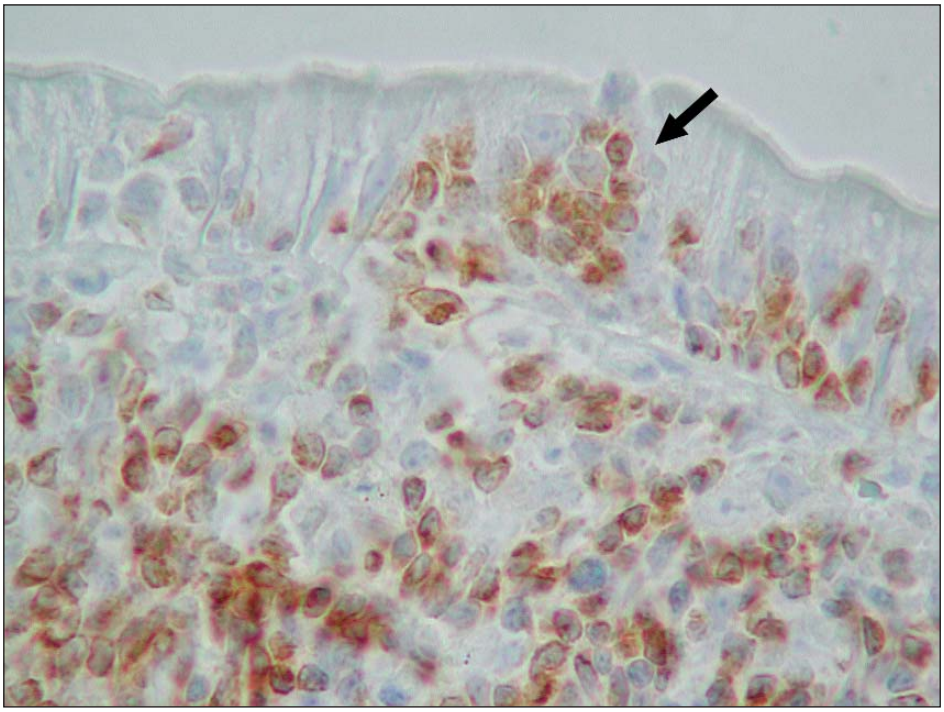

Figure 4 / Obr. 4
Low grade B-cell MALT lymphoma of the jejunum. Lymphoepithelial lesion (marked with arrow), infiltration of lymphoid cells into the epithelium, a typical sign of MALT type lymphoma. Immunohistochemistry, LCA, magnification 100x.
MALT lymfom jejuna (low grade B lymfom). Ložisková infiltrace lymfoidních buněk do epitelu, lymfoepiteliální léze (označena šipkou), typický znak MALT lymfomu. Imunohistochemie, LCA, zvětšení 100x.

inflammatory involvement of the distal duodenum (D4) and proximal jejunum was found in push-enteroscopy. The enteroclysis showed stenoses of the distal jejunum and proximal ileum with a prestenotic bowel dilatation. Non-specific proctitis was seen in colonoscopy. Systemic glucocorticosteroids (prednisone 20 mg per day) were started for three months, followed by topical corticosteroids (budesonide 9 mg per day). Immunosuppressive therapy by azathioprine (2.5 mg per kg per day) has been administrated since September 2001. Both Ebstein-Barr virus and cytomegalovirus were negative. Clinical and endoscopic remission was achieved and the patient did well for another 4 years, being controlled regularly.

In May 2005 he underwent control endoscopy, being still symptom-free. Barrett's oesophagus and reflux oesophagitis were found in gastroscopy. Helicobacter pylori was negative. There were several mucosal erosions in the duodenum (from D2 to D4) and proximal jejunum in push-enteroscopy. A 3-centimetre long segment of pathological appearance of the bowel was found in the proximal jejunum, trans-

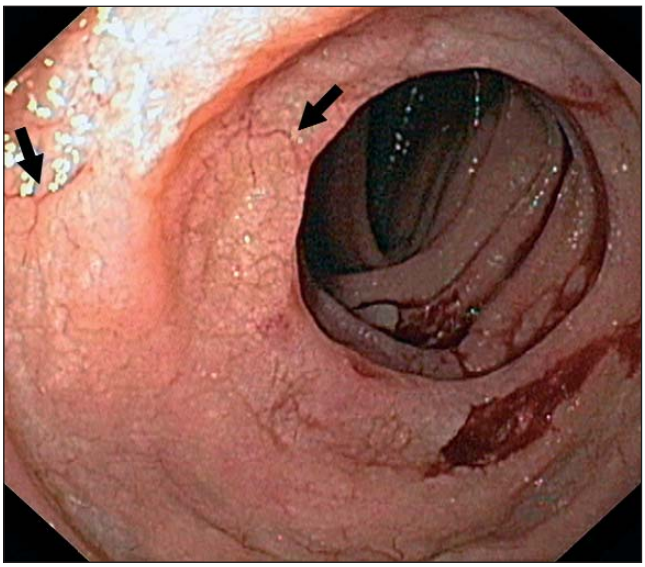

Figure 5 / Obr. 5
Low grade B-cell MALT lymphoma of the proximal jejunum. Enteroscopic control after chemotherapy. Endoscopic appearance has partially improved. However, tumorous neovascularization is still visible (arrows), fine granular relief of the mucosa is seen.
MALT lymfom (low grade B lymfom) proximálního jejuna. Enteroskopická kontrola po skončení chemoterapie. Endoskopický obraz částečně zlepšen. Nádorová neovaskularizace je však stále patrna (šipky), sliznice má jemný granulární reliéf.

verse folds were swollen, no villi were present and pathological vascularization was seen (Figs 1 and 2). Histology of biopsy specimens revealed severe jejunal infiltration by tumorous lymphoid cells (Fig 3). Immunophenotype of B-lymphocytes was CD20+ and CD79a+. Lymphoid cells expressed bcl-2, too, but CD5, CD23, CD10 and cyclin-D1 were negative. CD45-positive T-lymphocytes were identified at the periphery of tumorous infiltration. Lymphoepithelial lesions were found in immunohistochemistry (Fig 4). There was no lymphadenopathy found during the CT scan, histology of bone marrow (obtained by trepanobiopsy) was normal. Diagnosis of extranodal marginal zone B-cell lymphoma of MALT type was established. Six cycles of systemic chemotherapy COP regimen (cyclophosphamid, vincristine, and prednisone) were administrated. Control endoscopy after this initial chemotherapy found only a partial improvement (Fig 5) and that is why the treatment continued with second line immunochemotherapy with rituximab in November 2005 (dose of 375 mg/m2 given four times). Crohn's disease remains in full remission.

Discussion

We present a case of jejunal B-cell lymphoma in Crohn's disease. Enteroscopic appearance of the lymphoma was quite unusual, transverse folds were swollen, no villi were present and tumorous vascularization (newly formed vessels) was seen. We consider these pathological vessels as a unique sign of tumorous angiogenesis. Unlike this case, irregular nodular or polypoid pattern is usually seen and multiple ulcers with scaring could be found in a MALT type small intestinal lymphoma (5,18,51,54). We can hypothesize that this tumorous angiogenesis has been stimulated by means of cytokines mediated by T-lymphocytes infiltrating margins of the lymphoma. Other possible factor, bcl-2 family proteins (as important anti-apoptotic agents) are considered to be responsible for pathological neo-vascularization both in human & experimental oncology (24,48) and non-oncological cardiology (9,22). B-lymphocytes expressed bcl-2 proteins in the lymphoma of our case, too. Recently, Černoch (8) described similar pathological tumorous vessels in cholangioscopy of cholangiogenic carcinoma (Klatskin bile duct tumour).

Lymphoma occurring in the setting of idiopathic inflammatory bowel disease was first described by J. Arnold Bargen in 1928 (cited from 30). An association between inflammatory bowel disease and lymphoma has been described in several reports (17,26,31,47,50), most of which were retrospective, small, and derived from tertiary referral centres, raising the possibility of referral bias (34). In contrast, large population-based studies have found relative risks ranging from 0.4 to 2.4 (4,12,13,25,32,35,38,40). Considering the data in aggregate, they do not support an increased risk of lymphoma in patients with inflammatory bowel disease compared to the general population (3,34). However, whether the risk is increased in patients with IBD treated with azathioprine or 6-mercaptopurine remains unclear (39,49).

Data from transplant recipients and rheumatoid arthritis patients suggest that there is an increased risk of malignancy after treatment with azathioprine (41). However, risk of lymphoma in inflammatory bowel disease treated with azathioprine is low in general (4,14,28,33). Only Kandiel et al (23) found fourfold increased risk of lymphoma in inflammatory bowel disease treated with azathioprine or 6-mercaptopurine. Some authors even found no increased risk at all. Fraser et al (15) treated 626 of 2,204 patients (855 with Crohn's disease and 1,349 with ulcerative colitis) with azathioprine for a mean period of 27 months. Mean follow-up from the start of azathiopri-

ne was 7 years. Eight patients had lymphoma, only three had been given azathioprine.

Treatment of inflammatory bowel disease with azathioprine or 6-mercaptopurine appears to be associated with a slightly increased risk of Epstein-Barr virus positive lymphoma (1,6,11,21,36,52). Both Ebstein-Barr virus and cytomegalovirus could be associated (may be causative?) with refractory inflammatory bowel disease (10,53). The patient in our case report was treated with azathioprine for 3 years. Both the Ebstein-Barr virus and cytomegalovirus were negative. Thus the possible role of azathioprine in the pathogenesis of MALT type lymphoma in this particular case remains unlikely.

Patients with moderate to severely active Crohn's disease treated with infliximab may have a small but real risk of developing severe infections and/or non-Hodgkin lymphoma (30,43,45). The patient in our case report has not been treated with any anti-TNF alfa agent. Helicobacter pylori may be involved in the pathogenesis of MALT lymphoma of the stomach (55) but not in that of the small intestine (7,27,46). Nevertheless, Helicobacter pylori was negative in our patient.

Population and patient cohort follow-up studies suggest that the risk of lymphoma in inflammatory bowel disease is low, with an absolute risk of about 0.03 % per person-year (2). In maintenance treatment with azathioprine to preserve remission of Crohn's disease the benefits outweigh the risk of lymphoma (33). However, awareness of endoscopic features of small intestinal lymphoma is mandatory for follow-up of these patients. This case report shows gastroenterologists the possibly unusual enteroscopic appearance of jejunal lymphoma.

REFERENCES

1. Adani GL, Baccarani U, Risaliti A, Aoki T, Avital I. The role of cytomegalovirus in inflammatory bowel disease and gastrointestinal lymphoma. Gastroenterology 2002; 123: 390.
2. Aithal GP, Mansfield JC. Review article: the risk of lymphoma associated with inflammatory bowel disease and immunosuppressive therapy. Aliment Pharmacol Ther 2001; 15: 1101 – 1108.
3. Askling J, Brandt L, Lapidus A, Karlen P, Bjorkholm M, Lofberg R, Ekbom A. Risk of haematopoietic cancer in patients with inflammatory bowel disease. Gut 2005; 54: 617 – 622.
4. Bernstein CN, Blanchard JF, Kliewer E, Wajda A. Cancer risk in patients with inflammatory bowel disease: a population-based study. Cancer 2001; 91: 854 – 862.
5. Bureš J, Rejchrt S et al. Small Bowel Investigation & Atlas of Enteroscopy. Praha: Grada Publishing, 2001, 480.
6. Calaminici MR, Sheaff MT, Norton AJ, Feakins RM. Ileocaecal Epstein-Barr virus-positive lymphoproliferative disorder complicating Crohnęs disease. Histopatology 1999; 35: 386 – 390.
7. Cavalli F, Isaacson PG, Gascoyne RD, Zucca E. MALT Lymphomas. Hematology. Am Soc Hematol Educ Program, 2001, p 241 – 258.
8. Černoch J. Percutaneous cholangioscopy. Analysis of our own 13-year results. Folia Gastroenterol Hepatol 2005; 3: 18 – 31.
9. Chen F, Eriksson P, Kimura T, Herzfeld I, Valen G. Apoptosis and angiogenesis are induced in the unstable coronary atherosclerotic plaque. Coron Artery Dis 2005; 16: 191 – 197.
10. Cottone M, Pietrosi G, Martorana G, Casa A, Pecoraro G, Oliva L, Orlando A, Rosselli M, Rizzo A, Pagliaro L. Prevalence of cytomegalovirus infection in severe refractory ulcerative and Crohn's colitis. Am J Gastroenterol 2001; 96: 773 – 775.
11. Dayharsh GA, Loftus EV Jr, Sandborn WJ, Tremaine WJ, Zinsmeister AR, Witzig TE, Macon WR, Burgart LJ. Epstein-Barr virus-positive lymphoma in patients with inflammatory bowel disease treated with azathioprine or 6-mercaptopurine. Gastroenterology 2002; 122: 72 – 77.
12. Ekbom A, Helmick C, Zack M, Adami HO. Extracolonic malignancies in inflammatory bowel disease. Cancer 1991; 67: 2015 – 2019.
13. Ekbom A, Helmick CG, Zack M, Holmberg L, Adami HO. Survival and causes of death in patients with inflammatory bowel disease: a population-based study. Gastroenterology 1992; 103: 954 – 960.
14. Farrell RJ, Ang Y, Kileen P, O'Briain DS, Kelleher D, Keeling PW, Weir DG. Increased incidence of non-Hodgkin's lymphoma in inflammatory bowel disease patients on immunosuppressive therapy but overall risk is low. Gut 2000; 47: 514 – 519.
15. Fraser AG, Orchard TR, Robinson EM, Jewell DP. Long-term risk of malignancy after treatment of inflammatory bowel disease with azathioprine. Aliment Pharmacol Ther 2002; 16: 1225 – 1232.
16. Haber DA, Mayer RJ. Primary gastrointestinal lymphoma. Semin Oncol 1988; 15: 154 – 169.
17. Hall CH Jr, Shamma M. Primary intestinal lymphoma complicating Crohn's disease. J Clin Gastroenterol 2003; 36: 332 – 336.
18. Hasegawa N, Tsuboi Y, Kato K, Yamada K, Morita K, Kuroiwa M, Ito H, Matsushima T, Ono K, Oshiro M. Endoscopic diagnosis of ileocecal mucosa-associated lymphoid tissue lymphoma. Gastrointest Endosc 1999; 50: 115 – 117.
19. Isaacson PG Gastrointestinal lymphomas of T- and B-cell types. Mod Pathol 1999; 12: 151 – 158.
20. Isaacson PG. Gastrointestinal lymphoma. Hum Pathol 1994; 25: 1020 – 1029.
21. Juffermans NP, Jager A, Kersten MJ, van Oers MH, Hommes DW. Epstein-Barr virus-related lymphomas in patients with inflammatory bowel disease. Gut 2000; 54: 1121 – 1125.
22. Kaga S, Zhan L, Altaf E, Maulik N. Glycogen synthase kinase-3beta/beta-catenin promotes angiogenic and anti-apoptotic signaling through the induction of VEGF, Bcl-2 and survivin expression in rat ischemic preconditioned myocardium. J Mol Cell Cardiol 2005; 39, in press.
23. Kandiel A, Fraser AG, Korelitz BI, Brensinger C, Lewis JD. Increased risk of lymphoma among inflammatory bowel disease patients treated with azathioprine and 6-mercaptopurine. Gut 2005; 54: 1121 – 1125.
24. Karl E, Warner K, Zeitlin B, Kaneko T, Wurtzel L, Jin T, Chang J, Wang S, Wang CY, Strieter RM, Nunez G, Polverini PJ, Nor JE. Bcl-2 acts in a proangiogenic signaling pathway through nuclear factor-kappaB and CXC chemokines. Cancer Res 2005; 65: 5063 – 5069.
25. Karlen P, Lofberg R, Brostrom O, Leijonmarck CE, Hellers G, Persson PG. Increased risk of cancer in ulcerative colitis: a population-based cohort study. Am J Gastroenterol 1999; 94: 1047 – 1052.
26. Kelly MD, Stuart M, Tschuchnigg M, Turner J, Tydd T. Primary intestinal Hodgkin's disease complicating ileal Crohn's disease. Aust N Z J Surg 1997; 67: 485 – 489.
27. Koh PK, Horsman JM, Radstone CR, Hancock H, Goepel JR,

Hancock BW. Localised extranodal non-Hodgkin's lymphoma of the gastrointestinal tract: Sheffield Lymphoma Group experience (1989-1998). Int J Oncol 2001; 18: 743 – 748.
28. Korelitz BI, Mirsky FJ, Fleisher MR, Warman JI, Wisch N, Gleim GW. Malignant neoplasms subsequent to treatment of inflammatory bowel disease with 6-mercaptopurine. Am J Gastroenterol 1999; 94: 3248 – 3253.
29. Krugmann J, Dirnhofer S, Gschwendtner A, Berresheim U, Greil R, Krugmann K, Fend F. Primary gastrointestinal B-cell lymphoma. A clinicopathological and immunohistochemical study of 61 cases with an evaluation of prognostic parameters. Pathol Res Pract 2001; 197: 385 – 393.
30. Kwon JH, Farrel RJ. The risk of lymphoma in the treatment of inflammatory bowel disease with immunossuppressive agents. Clin Rev Oncol Hematol 2005; 56: 169 – 178.
31. Lepicard A, Lamarque D, Levy M, Copie-Bergman C, Chaumette MT, Haioun C, Anglade MC, Delchier JC. Duodenal mucosa-associated lymphoid tissue lymphoma: treatment with oral cyclophosphamide. Am J Gastroenterol 2000; 95: 536 – 539.
32. Lewis JD, Bilker WB, Brensinger C, Deren JJ, Vaughn DJ, Strom BL. Inflammatory bowel disease is not associated with an increased risk of lymphoma. Gastroenterology 2001; 121: 1080 – 1087.
33. Lewis JD, Schwartz JS, Lichtenstein GR. Azathioprine for maintenance of remission in Crohn's disease: benefits outweigh the risk of lymphoma. Gastroenterology 2000; 118: 1018 – 1024.
34. Loftus EV Jr, Sandborn WJ. Lymphoma risk in inflammatory bowel disease: influences of referral bias and therapy. Gastroenterology 2001; 121: 1239 – 1242.
35. Loftus EV Jr, Tremaine WJ, Habermann TM, Harmsen WS, Zinsmeister AR, Sandborn WJ. Risk of lymphoma in inflammatory bowel disease. Am J Gastroenterol 2000; 95: 2308 – 2312.
36. Losco A, Gianelli U, Cassani B, Baldini L, Conte D, Basilisco G. Epstein-Barr virus-associated lymphoma in Crohn's disease. Inflamm Bowel Dis 2004; 10: 425 – 429.
37. Nakamura S, Matsumoto T, Takeshita M, Kurahara K, Yao T, Tsuneyoshi M, Iida M, Fujishima M. A clinicopathologic study of primary small intestine lymphoma: prognostic significance of mucosa-associated lymphoid tissue-derived lymphoma. Cancer 2000; 88: 286 – 294.
38. Palli D, Trallori G, Bagnoli S, Saieva C, Tarantino O, Ceroti M, d'Albasio G, Pacini F, Amorosi A, Masala G. Hodgkin's disease risk is increased in patients with ulcerative colitis. Gastroenterology 2000; 119: 647 – 653.
39. Peppercorn MA. Clinical manifestations and diagnosis of Crohn's disease in adults. UpToDate. Wellesley, 2005, vol 13.3. http://www.uptodate.com.
40. Persson PG, Karlen P, Bernell O, Leijonmarck CE, Brostrom O, Ahlbom A, Hellers G. Crohn's disease and cancer: a population-based cohort study. Gastroenterology 1994; 107: 1675 – 1679.
41. Ponticelli C, Passerini P. Gastrointestinal complications in renal transplantant recipients. Transplant International 2005; 18: 643 – 650.
42. Radaszkiewicz T, Dragosics B, Bauer P. Gastrointestinal malignant lymphomas of the mucosa-associated lymphoid tissue: factors relevant to prognosis. Gastroenterology 1992; 102: 1628 – 1638.
43. Reijasse D, Le Pendeven C, Cosnes J, Dehee A, Gendre JP, Nicolas JC, Beaugerie L. Epstein-Barr virus viral load in Crohn's disease: effect of immunosuppressive therapy. Inflamm Bowel Dis 2004; 10: 85 – 90.
44. Saito T, Toyoda H, Yamaguchi M, Nakamura T, Nakamura S, Mukai K, Fuke H, Wakita Y, Iwata M, Adachi Y, Shiku H. Ileocolonic lymphomas: a series of 16 cases. Endoscopy 2005; 37: 466 – 469.
45. Sandborn WJ, Loftus EV. Balancing the risks and benefits of infliximab in the treatment of inflammatory bowel disease. Gut 2004; 53: 780 – 782.
46. Schroy PC III, Freedman AS. Classification and pathology of gastrointestinal lymphomas. UpToDate. Wellesley, 2005, vol 13.3. http://www.uptodate.com.
47. Stephen MR, Farquharson MA, Sharp RA, Jackson R. Sequential malt lymphomas of the stomach, small intestine, and gall bladder. J Clin Pathol 1998; 51: 77 – 79.
48. Trisciuoglio D, Iervolino A, Zupi G, Del Bufalo D. Involvement of PI3K and MAPK signaling in bcl-2-induced vascular endothelial growth factor expression in melanoma cells. Mol Biol Cell 2005; 16: 4153 – 4162.
49. van Hogezand RA, Eichhorn RF, Choudry A, Veenendaal RA, Lamers CB. Malignancies in inflammatory bowel disease: fact or fiction? Scand J Gastroenterol 2002; 37, Suppl 236: 48 – 53.
50. Veldman W, van Beek M, Keuning JJ, Driessen WM. Regional enteritis complicating malignant lymphoma. Neth J Med 1996; 49: 82 – 85.
51. Wang HH, Lin JT, Chiu CC, Chiang IP, Wu MS, Wang TH. Endoscopic features of mucosa-associated lymphoid tissue lymphoma of the duodenum. Gastrointest Endosc 1995; 41: 258 – 261.
52. Wong NA, Herbst H, Herrmann K, Kirchner T, Krajewski AS, Moorghen M, Niedobitek F, Rooney N, Shepherd NA, Niedobitek G. Epstein-Barr virus infection in colorectal neoplasms associated with inflammatory bowel disease: detection of the virus in lymphomas but not in adenocarcinomas. J Pathol 2003; 201: 312 – 318.
53. Yanai H, Shimizu N, Nagasaki S, Mitani N, Okita K. Epstein-Barr virus infection of the colon with inflammatory bowel disease. Am J Gastroenterol 1999; 94: 1582 – 1586.
54. Yoshida N, Wakabayashi N, Nomura K, Konishi H, Yamamoto H, Mitsufuji S, Kataoka K, Taniwaki M, Yamagishi H, Okanoue T. Ileal mucosa-associated lymphoid tissue lymphoma showing several ulcer scars detected using double-balloon endoscopy. Endoscopy 2004; 36: 1022 – 1024.
55. Zucca E, Bertoni F, Roggero E, Cavalli F. The gastric marginal zone B-cell lymphoma of MALT type. Blood 2000; 96: 410 – 419.

Correspondence to: / adresa pro korespondenci:
Martina Pintérová Kolesárová, MD, 2nd Department of Medicine, Faculty of Medicine, Charles University Teaching Hospital,
Sokolská 581, 500 05 Hradec Králové, Czech Republic.
E-mail: mkolesarova@volny.cz