

Benign Tumor Research Literatures

Ma Hongbao ¹, Margaret Ma ², Yang Yan ¹

¹ Brookdale Hospital, Brooklyn, New York 11212, USA; ² Cambridge, MA 02138, USA
ma8080@gmail.com

Abstract: Cancer is the general name for a group of more than 100 diseases. Although there are many kinds of cancer, all cancers start because abnormal cells grow out of control. Untreated cancers can cause serious illness and death. The body is made up of trillions of living cells. Normal body cells grow, divide, and die in an orderly fashion. During the early years of a person's life, normal cells divide faster to allow the person to grow. After the person becomes an adult, most cells divide only to replace worn-out or dying cells or to repair injuries. This article introduces recent research reports as references in the benign tumor related studies.

[Ma H, Young M, Yang Y. **Benign Tumor Research Literatures**. *Cancer Biology* 2015;5(3):101-117]. (ISSN: 2150-1041). <http://www.cancerbio.net>. 9

Keywords: cancer; life; cell; medicine; biology; benign tumor

1. Introduction

Cancer is the general name for a group of more than 100 diseases. Although there are many kinds of cancer, all cancers start because abnormal cells grow out of control. Untreated cancers can cause serious illness and death. The body is made up of trillions of living cells. Normal body cells grow, divide, and die in an orderly fashion. During the early years of a person's life, normal cells divide faster to allow the person to grow. After the person becomes an adult, most cells divide only to replace worn-out or dying cells or to repair injuries.

The following introduces recent reports as references in the related studies.

Adam, C., M. Polivka, et al. "Papillary glioneuronal tumor: not always a benign tumor?" *Clin Neuropathol*. 2007 May-Jun;26(3):119-24.

Papillary glioneuronal tumor (PGNT) is a variant of ganglioglioma, characterized by a pseudopapillary structure with a single pseudostratified layer of small, cuboidal, GFAP-positive cells around hyalinized blood vessels. To date, less than 30 cases have been described with a usually benign course. We report two additional cases: a clinically, radiologically and histopathologically typical tumor in a 38-year-old man and an atypical tumor with histopathological features of anaplasia in a 74-year-old woman. The latter tumor showed the classical pseudopapillary pattern with ganglioid cells and some astrocytes between the papillae, but also had changes suggestive of anaplasia including necrosis, capillary endothelial proliferation, mitoses, dedifferentiation with loss of GFAP expression of the cuboidal cells and increased Ki-67 labeling of over 10%. Only one other case with increased proliferative activity in a minigemistocytic component has

previously been described. Our cases indicate that PGNT type of ganglioglioma can have a spectrum of anaplastic changes of higher grade.

Ballarini, C., M. Intra, et al. "Gastrointestinal stromal tumors: a "benign" tumor with hepatic metastasis after 11 years." *Tumori*. 1998 Jan-Feb;84(1):78-81.

Gastrointestinal stromal tumors (GIST) constitute the largest category of primary non-epithelial neoplasms of the stomach and small bowel. They are characterized by a remarkable cellular variability and their malignant potential is sometimes difficult to predict. Very recent studies, using mitotic count and tumor size as the best determinants of biological behavior, divide GISTs into three groups: benign, borderline and malignant tumors. We report on a male patient who underwent a right hepatectomy for a large metastasis 11 years after the surgical treatment of an antral-pyloric gastric neoplasm, histologically defined as leiomyoblastoma and with clinical, morphological and immunohistochemical features of benignity (low mitotic count, tumor size < 5 cm, low cellular proliferation index). Histological and immunohistochemical analysis of the hepatic metastasis showed the cellular proliferation index (Ki-67) to be positive in 25% of neoplastic cells, as opposed to the primary gastric tumor in which Ki-67 was positive in only 5% of neoplastic cells. In conclusion, although modern immunohistochemical techniques are now available to obtain useful prognostic information, the malignant potential of GISTs is sometimes difficult to predict: neoplasms clinically and histologically defined as benign could metastasize a long time after oncologically correct surgical treatment. Therefore, benign GISTs also require consistent, long-term follow-up.

Barajas, R. F., Jr., A. Perry, et al. "Intracranial subdural osteoma: a rare benign tumor that can be differentiated from other calcified intracranial lesions utilizing MR imaging." J Neuroradiol. 2012 Oct;39(4):263-6. doi: 10.1016/j.neurad.2011.11.003. Epub 2011 Dec 23.

We report the magnetic resonance (MR) imaging characteristics of subdural osteoma and other benign calcified intracranial lesions to highlight imaging features that differentiate between these disease entities. A 63-year-old woman presented with progressively altered mental status. Non-contrast CT demonstrated a densely calcified right middle cranial fossa extra-axial mass. MR imaging of the lesion demonstrated T1 and T2 hypointensity without evidence of contrast enhancement, parenchymal abnormality, or connection to adjacent venous structures. Diffusion weighted imaging demonstrated markedly decreased signal intensity and artificially reduced diffusion on apparent diffusion coefficient map. Histologically, the tumor was predominantly composed of lamellar bone and small fragments of residual dura consistent with subdural osteoma. This case demonstrates that radiological examination can provide additional insight into the origin of intracranial osteomas (extradural versus subdural versus sinonasal) and help distinguish from other diagnostic considerations including benign meningeal ossification and calcified meningioma prior to surgical resection.

Bardisi, E. S., N. Alghanmi, et al. "Primary mucosa-associated lymphoid tissue lymphoma of the esophagus masquerading as a benign tumor." Ann Med Surg (Lond). 2014 May 20;3(2):39-42. doi: 10.1016/j.amsu.2014.05.001. eCollection 2014 Jun.

We report a case of primary esophageal low-grade B-cell lymphoma of MALT type in a 50-year-old Saudi male patient who presented to our hospital with a history of dysphagia and heartburn for more than 2 years. Endoscopy showed a large esophageal mass with an intact mucosa located in the distal esophagus, 28 cm-35 cm from the incisor teeth. Endoscopic ultrasonography (EUS) showed a large well demarcated sub-epithelial lesion 4 cm in width and 10 cm in length arising from the muscularis mucosa with mixed echogenicity consistent with benign leiomyoma. Subsequently, the patient underwent surgical resection of the tumor; the histopathology confirmed the diagnosis of esophageal lymphoma. The tumor was considered to be completely resected and therefore additional treatment was not administered. The patient was doing well on follow up after treatment. Clinically and radiologically he did not reveal any signs of recurrence. Surgical resection is beneficial as a primary treatment option in

incipient primary low grade MALT esophageal lymphomas.

Barman, S., K. C. Mandal, et al. "Adrenal myelolipoma: An incidental and rare benign tumor in children." J Indian Assoc Pediatr Surg. 2014 Oct;19(4):236-8. doi: 10.4103/0971-9261.142019.

Myelolipoma is a rare benign tumor of adrenal gland and rarer in children. Myelolipoma contains adipose tissue and myeloid precursor producing white blood cells (WBC), red blood cells (RBC) and megakaryocytes. Asymptomatic tumor does not require treatment whereas symptomatic tumor needs operation. We are reporting a rare adrenal myelolipoma in a child with review of literature.

Baron Toaldo, M., A. Diana, et al. "Imaging diagnosis-cholangiocellular adenoma: contrast-enhanced ultrasonographic findings of a benign tumor mimicking malignant neoplasia in a dog." Vet Radiol Ultrasound. 2013 Jan-Feb;54(1):71-4. doi: 10.1111/j.1740-8261.2012.01991.x. Epub 2012 Oct 24.

A 9-year-old Giant Schnauzer was referred for polyuria and polydipsia. On abdominal ultrasound, a hyperechoic mass with low color Doppler signal was detected in the medial right hepatic lobe. Contrast-enhanced ultrasound (CEUS) demonstrated increased enhancement of the mass during the arterial phase, and contrast washout during portal and late phases with decreased enhancement relative to the liver. These findings were consistent with primary liver malignancy or liver metastasis. A final diagnosis of cholangiocellular adenoma was made based on histopathology. To our knowledge, this is the first description of a benign hepatic neoplasm exhibiting malignant CEUS characteristics in a dog.

Beall, C., E. Delzell, et al. "Cancer and benign tumor incidence among employees in a polymers research complex." J Occup Environ Med. 2001 Oct;43(10):914-24.

The detection of several intracranial tumors among employees in one building complex (C500) at a petrochemical research facility prompted investigation of a possible workplace cause. This retrospective follow-up study included 1847 subjects, of whom 1735 had worked in C500. Medical records, death certificates, and Illinois State Cancer Registry data confirmed self-reported cancers and tumors. Analyses compared the subjects' cancer and benign intracranial tumor incidence rates with national general population rates. C500 employees had 15% fewer than expected total cancers (92 observed/108 expected; standardized incidence ratio [SIR], 85; 95% confidence interval [95% CI], 69 to 104). An excess

of brain cancer (6/2.0; SIR, 302; 95% CI, 111 to 657) was concentrated among white men who had 10 or more years since hire and 5 or more years of C500 employment (4/0.7; SIR, 602; 95% CI, 165 to 1552) and who had worked in a particular building of C500 (5/0.7; SIR, 735; 95% CI, 239 to 1716). An excess of benign intracranial tumors (6/1.6; SIR, 385; 95% CI, 142 to 839) was not restricted to a single type of tumor and was not concentrated in any particular building. Occupational exposure may have caused the increased rate of brain cancer but is a less likely explanation for the elevated rate of benign intracranial tumors.

Biswas, P. K., J. Niu, et al. "Numerical simulation and graphical analysis of in vitro benign tumor growth: application of single-particle state bosonic matter equation with length scaling." *J Mol Model.* 2006 Jul;12(5):641-8. Epub 2006 Mar 23.

We describe the application of a non-linear single-particle state bosonic condensate equation to simulate multicellular tumor growth by treating it as a coupling of two classical wave equations with real components. With one component representing the amplitude of the cells in their volume growth phase and the other representing the amplitude of the cells in their proliferation or mitosis phase, the two components of the coupled equation feed each other during the time evolution and are coupled together through diffusion and other linear and non-linear terms. The features of quiescent and necrotic cells, which result from poor nutrient diffusion into a tumor, have been found to correspond quite well to experimental data when they are modeled as depending on higher cell density. Classical hallmarks of benign tumor growth, such as the initial rapid growth, followed by a dramatic collapse in the proliferating cell count and a strong re-growth thereafter appear quite encouragingly in the theoretical results.

Bydon, A., J. A. Gutierrez, et al. "Meningeal melanocytoma: an aggressive course for a benign tumor." *J Neurooncol.* 2003 Sep;64(3):259-63.

A 79-year-old female presented with difficulty ambulating and was found to have weakness and hyperreflexia in the lower extremities. Magnetic resonance imaging (MRI) revealed a large T8-T9 intraspinal tumor. She underwent a thoracic laminectomy, and excision of an intradural extramedullary lesion. The surgical specimen was soft, black tissue that consisted of a moderately cellular, deeply pigmented tumor. The neoplastic cells proved to be melanocytic, and were devoid of overt features of anaplasia, i.e., prominent nuclear pleomorphism, necrosis, significant mitotic activity,

and high proliferation indices. Four months postoperatively, MRI demonstrated focal areas of enhancement in the conus medullaris and in the fourth ventricle, indicating leptomeningeal spread. Subsequently, the patient underwent whole brain radiation. On repeat imaging, there was nodular enhancement of the fourth ventricle and throughout the spinal cord. Despite chemotherapy and radiation therapy, the disease advanced and the patient expired. Meningeal melanocytoma is a rare, histologically benign tumor with good prognosis. However, local aggressive behavior has been recorded, especially in cases of subtotal gross resection.

Chavez Martinez, S., M. L. Arias Gonzalez, et al. "[Cotyledonoid dissecting leiomyoma of the uterus. A malignant-looking benign tumor]." *Ginecol Obstet Mex.* 2012 Aug;80(8):528-33.

The cotyledonoid dissecting leiomyoma of the uterus, or Stenberg tumor, is a rare variant of a smooth muscle benign tumor, classified in the group presenting an unusual growth pattern; clinically, it affects women in reproductive age. We report the case of a 43 year-old woman, who turned up at the Centro Estatal de Atencion Oncologica (State Cancer Care Center) in Morelia, Michoacan, presenting abnormal uterine bleeding and uterine fibroid of major elements. When performing a palpatory bimanual exam, a loose uterus of approximately 7 by 6 inches was identified; it ached when moving. The laboratory tests reported normal parametrium; the ultrasound showed, however, uterine fibroids of major elements. The uterus was enlarged due to a tumor of exophytic growth, which resembles placental cotyledons extended over the uterine surface, composed by smooth muscle nodules that dissected the uterine wall, and with infiltrative appearance in parametrium and the myometrial wall. Despite this microscopic aggressive appearance, a number of ultrastructural studies and immunohistochemical techniques proved its benign nature. This can help patients who want to preserve fertility avoid radical surgery.

Constancis, P., G. Arvis, et al. "[Primary solid tumors of the epididymis. Apropos of 4 cases of benign tumor and one case of malignant mesothelioma]." *Ann Urol (Paris).* 1987;21(6):387-90.

Based on a series of 5 tumours of the epididymis, the authors recall the relative frequency of primary solid tumours of the epididymis. They present 2 benign mesotheliomas and discuss the various histogenetic theories for their development, one fibroma, one haemangio-fibro-leiomyoma and one malignant mesothelioma of the cord, invading the epididymis. These are rare tumours (Broth's review of the literature revealed 278 cases in the world,

consisting of 209 benign tumours (75%) and 69 malignant tumours (25%). The most frequent benign tumour is the mesothelioma (75% of the benign tumours), formerly referred to as an "adenomatoid tumour". Its histogenesis is still controversial (epithelial or mesothelial origin). The mesothelial theory is the more widely accepted. According to the majority of authors, malignant mesothelioma of the epididymis does not exist, but our case of malignant tumour questions this concept. The other tumours consist of benign and malignant mesenchymal, epithelial or dysembryoplastic tumours. The borderline with spermatic cord tumours is not always easy to define. The authors recall the value of comparative scrotal ultrasonography for the topographical diagnosis of tumours of the epididymis and testicular tumours and the differential diagnosis with certain epididymal cysts.

Cornette, J., S. Festen, et al. "Mesenchymal hamartoma of the liver: a benign tumor with deceptive prognosis in the perinatal period. Case report and review of the literature." Fetal Diagn Ther. 2009;25(2):196-202. doi: 10.1159/000212057. Epub 2009 Apr 9.

This article reports a case of perinatal mesenchymal hepatic hamartoma and reviews the literature on the subject. A fetus presented with polyhydramnios and a large multiloculated cystic abdominal mass at 33 weeks of gestation. The ultrasound appearance was most consistent with a mesenteric cyst. Prenatal drainage was considered, due to the size of the lesion. However, a conservative management was opted for. A female infant was born at 35 weeks by classical cesarean section. The immediate postnatal period was characterized by hemodynamic instability. Laparotomy revealed a pedunculated mesenchymal hamartoma of the liver, which could not completely be resected. The infant had an uneventful postoperative recovery and is doing well at 6 months of age. Hepatic mesenchymal hamartoma are rare benign tumors. Most cases are detected in early childhood. They usually present as a cystic rapidly growing abdominal mass. Prenatal diagnosis remains challenging. In children diagnosed in the perinatal period, the outcome seems worse and determined by the compressive effect of the mass.

de Lima Junior, M. M., C. B. Sampaio, et al. "Leiomyoma--a rare benign tumor of the female urethra: a case report." J Med Case Rep. 2014 Nov 13;8:366. doi: 10.1186/1752-1947-8-366.

INTRODUCTION: Leiomyoma in the urethra is a rare occurrence. These are rare benign mesenchymal tumors that arise from the smooth muscle of the urethra. Such tumors often appear in

females during their reproductive age (from menarche to menopause); the mean age of their appearance is approximately 41 years. CASE PRESENTATION: We report here a case of a 52-year-old White woman who presented with complaints of sporadic hematuria, dyspareunia, and feeling of nodulation in her vagina. CONCLUSIONS: Histopathological studies confirmed the urethral leiomyoma, and the surgery completely resolved the original symptoms. Although the average age of occurrence of such tumors in females is about 41 years, the present case involves an older woman of 52 years. Most importantly, the mass was located in the distal urethra, an uncommon site of presentation of leiomyoma in females.

De Nictolis, M., G. Goteri, et al. "Elastofibrolioma of the mediastinum. A previously undescribed benign tumor containing abnormal elastic fibers." Am J Surg Pathol. 1995 Mar;19(3):364-7.

We report the case of a 57-year-old woman who was found to have a mass in the anterior mediastinum. Surgical excision of the mass revealed a well-delimited lesion 10 cm in largest diameter. Histologically, the mass was composed of mature fat alternating with sclerotic connective tissue, which also contained extensive eosinophilic deposits, similar to the abnormal elastic fibers seen in elastofibroma dorsi. The elastic nature of these deposits was confirmed by elastic staining and electron microscopy. We consider this lesion, which we named elastofibrolioma, a true benign neoplasm that is characterized by tumoral elastogenesis.

Demirhan, O., S. Ozkara, et al. "A rare benign tumor of the lung: Inflammatory myofibroblastic tumor - Case report." Respir Med Case Rep. 2013 Feb 4;8:32-5. doi: 10.1016/j.rmcr.2013.01.001. eCollection 2013.

A fifty year old lady who was operated for thyroid cancer two years ago and completed adjuvant therapy, underwent a computer tomography (CT) of the chest during her follow up. The CT showed a mass lesion in the right lung, located to the lateral segment of the middle lobe. There were no intrabronchial lesions on bronchoscopy. Positron emission CT (PET CT) showed a dense hypermetabolic mass located in the right middle lobe lateral segment and having malignant characteristics. A videothoroscopic wedge resection was performed and the specimen was sent for frozen section, which showed no evidence of malignancy. Pathology report revealed an inflammatory myofibroblastic tumor (IMT). Since IMT is a rare benign tumor of the lung, we herein report this patient along with a discussion of the relevant literature.

Figarella-Branger, D., H. Dufour, et al. "Pituicytomas, a mis-diagnosed benign tumor of the neurohypophysis: report of three cases." Acta Neuropathol. 2002 Sep;104(3):313-9. Epub 2002 Jun 19.

Pituicytoma is a rare benign primary tumor of the neurohypophysis, occurring in the sellar and suprasellar spaces. We report here three new cases with immunohistochemical and electron microscopic study. Particular attention was paid to the expression of some cell adhesion molecules. These tumors were characterized by bundles of elongated cells strongly immunoreactive to anti-vimentin, S-100 protein, neural cell adhesion molecule and neuron-specific enolase antibodies. Glial fibrillary acidic protein (GFAP) was not recorded. It expressed the very late antigen alpha2 (VLAalpha2), but not VLAalpha5, and lacked epithelial markers expression (epithelial membrane antigen, E-cadherin), and specific neuronal markers (synaptophysin, chromogranin, neurofilament). Staining for pituitary hormones was negative. At the ultrastructural level, tumor/blood vessel basal lamina and cytoplasmic intermediate filaments were observed but desmosome or pericellular basal lamina were lacking. In one case few secretory granules were recorded. Differential diagnoses include granular cell tumors, pilocytic astrocytomas and spindle cell tumors such as solitary fibrous tumors, fibroblastic meningiomas and schwannomas. However, the unique pattern of antigenic expression and ultrastructural features of pituicytomas distinguish this rare tumor.

Frischenschlager, O., B. Balogh, et al. "[Psychosocial effects of plastic surgery reconstruction of the female breast following amputation for malignant/benign tumor]." Psychother Psychosom Med Psychol. 1990 Nov;40(11):441-7.

A total of 98 woman (malignant/benign tumors of the breast, mastectomy with/without subsequent reconstructive surgery as well as healthy controls) were examined in terms of subjective well-being, psychosomatic reaction patterns, subjective impairment due to mastectomy and satisfaction with the outcome of reconstructive surgery in this empiric retrospective study. In addition, numerous sociographic data were obtained. On the average, the examined women were satisfied with the outcome of reconstructive surgery and tended to be disappointed with regard to the desired psychosocial improvement. Objective tests demonstrate that subjective well-being was less favorable after reconstructive breast surgery than in women without reconstruction. In the group "benign tumor with subsequent reconstruction" the reaction to emotional strain was significantly more characterized by regressive behavior and withdrawal

than in the group "benign tumor without reconstruction".

Hendriks, M. P., C. M. Driessen, et al. "Aggressive fibromatosis in the head and neck region: Benign tumor with often mutilating effects." Head Neck. 2013 Aug;35(8):E246-50. doi: 10.1002/hed.23092. Epub 2012 Aug 21.

BACKGROUND: Aggressive fibromatosis (AF) or desmoid tumor of the head and neck region is a rare, usually unresectable, benign soft tissue tumor with locally aggressive behavior. **METHODS AND RESULTS:** A 31-year-old woman presented with a progressive trismus, a swelling in the retromandibular area, as well as loss of sensibility of the maxillary and mandibular branch of the trigeminal nerve. MRI of the head and neck revealed an infiltrative mass involving the masticator, parapharyngeal, and prevertebral and paravertebral space on the left with intracranial extension through the orbital fissure. After the fifth biopsy, 15 months after presentation, the diagnosis of AF was made. The tumor was unresectable, so intensity-modulated radiotherapy was given with curative intent using a total dose of 60 Gy in 30 fractions of 2 Gy. After 16 months, she showed progressive disease, for which tamoxifen 40 mg twice daily was started with a good response for 2 years. After that, she started with sorafenib, on which she has stable disease now. **CONCLUSION:** The often long delay in proper diagnosis and the treatment challenges of a desmoid tumor are illustrated in this case. Furthermore, this article reviews the literature concerning AF, especially of the head and neck region.

Henriksen, R., F. B. Sorensen, et al. "Expression of FK506 binding protein 65 (FKBP65) is decreased in epithelial ovarian cancer cells compared to benign tumor cells and to ovarian epithelium." Tumour Biol. 2011 Aug;32(4):671-6. doi: 10.1007/s13277-011-0167-4. Epub 2011 Mar 12.

FK506 binding protein 65 (FKBP65) belongs to a group of proteins termed immunophilins that have a high binding affinity to immunosuppressant drugs as FK506 (tacrolimus) and rapamycin (sirolimus). Treatment of female premenopausal women with tacrolimus, which binds to FKBP65, has been reported to be followed by a strongly increased risk of ovarian cysts. We performed the present study to reveal how FKBP65 is expressed in the ovary and in ovarian tumors and to see if this expression might be related to ovarian tumor development, a relationship we have found in colorectal cancer. Biopsies from prospectively collected samples from ovaries and benign, borderline, and invasive ovarian tumors were analyzed for expression of FKBP65 by

immunohistochemistry. The expression was compared to survival and several clinicopathological parameters. FKBP65 is strongly expressed in ovarian epithelium and in benign ovarian tumor cells. In the ovary, a positive staining was also found in endothelial cells of blood vessels. In non-invasive and in invasive malignant tumor cells, a decreased staining was observed, which was not correlated to stage, histology, or survival. A significant inverted correlation to expression of p53 was found. The differential expression of FKBP65 indicates a role in ovarian physiology as well as in ovarian tumor development. Our observations and the chromosomal localization of the FKBP65 gene indicate a tumor suppressor function of the FKBP65 protein in ovarian carcinogenesis.

Joseph, J., D. Ritchie, et al. "Bizarre parosteal osteochondromatous proliferation: a locally aggressive benign tumor." Clin Orthop Relat Res. 2011 Jul;469(7):2019-27. doi: 10.1007/s11999-011-1898-7. Epub 2011 Apr 30.

BACKGROUND: Bizarre parosteal osteochondromatous proliferation (BPOP) is a benign lesion of bone, and numerous questions remain unresolved regarding its etiology, diagnosis, and treatment. **QUESTIONS/PURPOSES:** We present the Scottish Bone Tumour Registry experience of this rare lesion. **PATIENTS AND METHODS:** We performed a retrospective analysis of the Scottish Bone Tumour Registry records. Histologic specimens were reexamined by a musculoskeletal pathologist. Radiographs were reevaluated by a musculoskeletal radiologist. **RESULTS:** From 1983 to 2009, 13 cases (13 patients; six male, seven female) were identified. Their ages ranged from 13 to 65 years. All patients presented with localized swelling. Pain was present in five. Antecedent trauma was present in two. Nine lesions affected the hand, three the foot, and one the tibial tuberosity. Twelve lesions were excised and one was curetted. There were seven recurrences of which six were excised. One lesion recurred a second time and was excised. There were no metastases. Radiographs showed densely mineralized lesions contiguous with an uninvolved cortex. Cortical breakthrough was present in one case and scalloping in another. Histologic analysis characteristically showed hypercellular cartilage with pleomorphism and calcification/ossification without atypia, bone undergoing maturation, and a spindle cell stroma. **CONCLUSIONS:** BPOP is a rare benign lesion that probably is neoplastic, with no gender predilection, and affecting patients over a wide age range. Previously trauma was considered an etiologic factor, but this no longer seems to be the case. The rate of recurrence was 50%, which may indicate a more

extensive resection is required for this locally aggressive lesion. No metastases were reported. BPOP should not be mistaken for, or treated as, a malignant tumor. **LEVEL OF EVIDENCE:** Level IV, retrospective case series. See Guidelines for Authors for a complete description of levels of evidence.

Kaddoura, I. and G. Zaatari "Fibro-osseous pseudotumor of the thenar eminence: a rare aggressive but benign tumor." Ann Plast Surg. 2009 Mar;62(3):326-8. doi: 10.1097/SAP.0b013e31817e9d35.

Fibro-osseous pseudotumor is a rare benign lesion that is characterized by fibroblastic proliferation with foci of osseous differentiation. The tumor commonly involves the digits and is usually mistaken for malignancy because of its aggressive nature thus resulting in surgical over treatment. We report a patient with fibro-osseous pseudotumor that involved the thenar eminence and was managed successfully by local resection from the surrounding structures with no residual loss of function.

Kalkanis, A., M. Trianti, et al. "A clear cell tumor of the lung presenting as a rapidly growing coin lesion: is it really a benign tumor?" Ann Thorac Surg. 2011 Feb;91(2):588-91. doi: 10.1016/j.athoracsur.2010.07.043.

There are few reported cases of clear cell tumor of the lung, a very rare benign mesenchymal neoplasm. We describe a 41-year-old asymptomatic man who presented with a coin lesion in a routine chest roentgenogram that was absent in a roentgenogram performed a year earlier. After a thorough workup, including radionuclide scintigraphy, the diagnosis of cell tumor of the lung was established. Somatostatin receptor positivity was demonstrated, and this clear cell tumor of the lung had a rapid growth rate. Because of these features, the benign nature of such a tumor remains questionable.

Karthikeyan, P. and P. Paulraj "An unusual benign tumor of pinna - A case report." Indian J Otolaryngol Head Neck Surg. 2010 Jun;62(2):195-7. doi: 10.1007/s12070-010-0022-8. Epub 2010 Sep 24.

A 12-year-old girl presented to us with a swelling over the lateral surface of the right pinna of 4 years duration. Examination revealed an irregular mass arising from lateral surface of the pinna obscuring the external auditory canal. The lesion was not ulcerated. Wide excision of mass done and sent for Histopathological examination which revealed Tricho folliculoma. This case is being reported as it is a rare skin adnexal tumor arising from an unusual site.

Kawashima, Y., A. C. Campos, et al. "Ability of a benign tumor to decrease spontaneous food intake and body weight in rats." Cancer. 1989 Feb 15;63(4):693-9.

Malignant tumors induce anorexia and decrease spontaneous food intake and weight loss. Whether these effects are in part due to the tumor's physical size was investigated by inducing a benign cystic tumor mass with carrageenan in rats and then studying them for 21 days. Forty-two control rats were given subcutaneous injection of 3 ml of normal saline. Fifty-six study rats were given 3 ml of a 1.5% carrageenan solution subcutaneously, both in the right flank. Daily spontaneous food intake, body weight, and tumor weight were measured. Eight study and six control rats were randomly sacrificed on days 1, 3, 5, 7, 10, 14, and 21. Blood was obtained by cardiac puncture for albumin determination, and the tumor, carcass, liver, and spleen were removed and weighed. Tumor and tissue samples were histologically examined. All rats injected with carrageenan developed a benign cystic tumor mass. Early cystic wall consisted mainly of foamy macrophages with a light lymphoplasmacytic chronic inflammatory infiltrate and moderate vascularization. At day 21, cystic wall was more compact. The vasculature had collapsed and there were more pronounced fibroblastic response and collagen bundles. Average tumor weight by day 21 was 41 g. Average spontaneous food intake was depressed by about 15% from day 8 on in study rats as compared to controls. A significant decrease in carcass weight of 15.2% was observed in study as compared to control rats at day 21. Serum albumin was significantly decreased in study rats after day 5. Liver weight was significantly lower and spleen weight higher in study rats as compared to controls. These data suggest that some characteristics associated with cancer anorexia can be found in the absence of malignancy.

LeMaire, W. J., C. Kreiss, et al. "Neurilemmoma: an unusual benign tumor of the cervix." Alaska Med. 2002 Jul-Sep;44(3):63-5.

BACKGROUND: A Neurilemmoma (also called Schwannoma) is a benign, slowly growing neoplasm of the Schwann cells which may occur in association with any nerve. Its finding in the cervix of the uterus is extremely rare. **CASE:** At a routine annual exam, a 47-year-old woman was found to have a tumor on the posterior lip of the cervix. The patient was completely asymptomatic. The tumor was excised using a large electrical loop (LEEP) and found to be a benign Neurilemmoma. Subsequently a CT scan of the pelvis did not reveal any other abnormalities and no further treatment was contemplated. **CONCLUSION:** A benign neurilemmoma can present on the cervix as

a vascular appearing tumor. This is a most unusual location for this tumor which arises from the Schwann cell of a nerve sheet.

Lemesle, M., J. P. Borsotti, et al. "[Dysembryoplastic neuroepithelial tumors. A benign tumor cause of partial epilepsy in young adults]." Rev Neurol (Paris). 1996 Jun-Jul;152(6-7):451-7.

Dysembryoplastic neuroepithelial tumor (DNT) is a newly recognized brain lesion first reported in 1988 by Daumas-Duport et al. The authors described five cases of DNT, that occurred in young people and were characterized by partial seizures. Seizures could become intractable and secondary generalised. Usually, the interictal neurological examination was normal. In most cases, computed tomography showed a supratentorial, "pseudocystic" low density appearance associated in some cases with calcific hyperdensity or focal contrast enhancement. Magnetic resonance imaging demonstrated a predominantly intracortical lesion. Common features included low signal intensity on T1-weighted images and high signal on T2-weighted images. Temporal and frontal lobes were mainly involved. Dysembryoplastic origin explained the clinical and radiological stability and the benign evolution of this tumor. Tumor resection was required only when epilepsy was intractable or when there was intracranial hypertension. Earlier intervention can prevent the physical and psychosocial damage resulting from chronic seizures and can improve the prognosis for these young patient. Histologically, DNT have been incorporated among the category of neuronal and mixed neuronogial tumors. Three patterns are described: a simple form with a unique glioneuronal element, a complex form with specific glioneuronal element, nodules being made of multiple variants looking like astrocytomas, oligodendrogliomas or oligo-astrocytomas, foci of dysplastic cortical disorganisation, and a non specific form. When specific glioneuronal component is absent (50% of cases), the identification of DNT has therapeutic and prognostic implications because aggressive therapy may be avoided, sparing these young patients the long term effects of radio-or chemotherapy.

Mangioni, S., P. Vigano, et al. "Overexpression of the Wnt5b gene in leiomyoma cells: implications for a role of the Wnt signaling pathway in the uterine benign tumor." J Clin Endocrinol Metab. 2005 Sep;90(9):5349-55. Epub 2005 Jun 21.

CONTEXT: Uterine leiomyomas are the most common tumors in the human female pelvis and the leading indication for pelvic surgery. The molecular causes of the disease remain unknown. **OBJECTIVE:** Using an oligonucleotide microarray-

based hybridization analysis, we observed that a Wnt family member transcript, Wnt5b, was overexpressed in smooth muscle cells (SMC) derived from leiomyomas when compared with matched myometrial cells. Based on this finding and on previous observations, we have hypothesized that altered expression of specific Wnt family members might be involved in leiomyoma formation and/or growth. **MAIN OUTCOME MEASURES:** The expression patterns of two members of the Wnt pathway, Wnt5b and secreted frizzled related protein (sFRP)1, were evaluated in myometrial SMC (n = 22) and in leiomyoma cells (n = 27) by real-time quantitative PCR. In addition, regulation of expression of the two molecules was examined. **RESULTS:** Compared with myometrial SMC, cells derived from leiomyomas had significantly higher levels of both Wnt5b and sFRP1 transcripts. When the data were analyzed as a function of the phase of the menstrual cycle, no significant difference in sFRP1 mRNA levels could be detected, whereas levels of Wnt5b transcript were significantly higher in the secretory phase in myometrial cells. Treatment with 9-cis retinoic acid significantly inhibited Wnt5b expression in myometrial SMC but not in their leiomyoma counterparts. **CONCLUSIONS:** Specific Wnt signaling genes are overexpressed in leiomyoma cells. Moreover, in these cells, the regulation of Wnt5b expression by retinoids appears to be attenuated.

Mankin, H. J. and K. P. Mankin "Schwannoma: a rare benign tumor of soft tissues." Musculoskelet Surg. 2014 Aug;98(2):95-9. doi: 10.1007/s12306-014-0333-0. Epub 2014 Jun 24.

Schwannomas are unusual benign tumors which arise from the surface of neural elements of the body or within the brain. They do not as a rule metastasize but may cause sometimes severe local problems on the nerves, blood vessels and adjacent bone. The tumors arise from the Sheath of Schwann, a structure on the surface of a nerve. The lesions may expand and cause considerable damage to adjacent tissues. They do not arise within bone since there are no Sheaths of Schwann within the osseous tissue but may cause local damage to the bony cortex and sometimes fractures. Rarely the lesions may metastasize and cause patients' death. The treatment is usually local resection, and most often is successful although may cause damage to the adjacent nerve.

Mautner, V. F., F. A. Asuagbor, et al. "Assessment of benign tumor burden by whole-body MRI in patients with neurofibromatosis 1." Neuro Oncol. 2008 Aug;10(4):593-8. doi: 10.1215/15228517-2008-011. Epub 2008 Jun 17.

People with neurofibromatosis 1 (NF1) have multiple benign neurofibromas and a 10% lifetime risk of developing malignant peripheral nerve sheath tumors (MPNSTs). Most MPNSTs develop from benign plexiform neurofibromas, so the burden of benign tumors may be a risk factor for developing MPNST. We studied 13 NF1 patients with MPNSTs and 26 age- and sex-matched controls (NF1 patients who did not have MPNSTs) with detailed clinical examinations and whole-body MRI to characterize their body burden of internal benign neurofibromas. Internal plexiform neurofibromas were identified in 22 (56%) of the 39 NF1 patients studied. All six of the NF1 patients with MPNSTs under 30 years of age had neurofibromas visualized on whole-body MRI, compared to only 3 of 11 matched NF1 controls under age 30 (p < 0.05). Both the median number of plexiform neurofibromas (p < 0.05) and the median neurofibroma volume (p < 0.01) on whole-body MRI were significantly greater among MPNST patients younger than 30 years of age than among controls. No significant differences in whole-body MRI findings were observed between NF1 patients with MPNSTs and controls who were 30 years of age or older. Whole-body MRI of NF1 patients allows assessment of the burden of internal neurofibromas, most of which are not apparent on physical examination. Whole-body imaging of young NF1 patients may allow those at highest risk for developing MPNST to be identified early in life. Close surveillance of these high-risk patients may permit earlier diagnosis and more effective treatment of MPNSTs that develop.

Murphy, A. M., A. M. Buck, et al. "Increasing detection rate of benign renal tumors: evaluation of factors predicting for benign tumor histologic features during past two decades." Urology. 2009 Jun;73(6):1293-7. doi: 10.1016/j.urology.2008.12.072. Epub 2009 Apr 15.

OBJECTIVES: To determine whether the detection of benign renal tumors is increasing and to identify the predictors of benign histologic features. The detection of renal cortical tumors has increased with the increased use of abdominal imaging. Current imaging and biopsy techniques cannot predict the renal tumor histologic features with complete accuracy, and many patients undergo surgery for benign lesions. **METHODS:** The Columbia Urologic Oncology Database was reviewed, and 1244 patients who had undergone partial or radical nephrectomy from 1988 to 2007 were identified. A cohort of 775 patients with a tumor diameter of <or.0 cm, nonmetastatic disease, and nonfamilial disease was selected. Univariate and multivariate logarithmic regression analyses were used to determine the parameters to predict for benign histologic features.

RESULTS: The proportion of renal surgery for benign tumors of ≤ 0 cm in diameter has increased annually. When patients were stratified by the year of surgery, the proportion of benign tumors was 5.0% before 1998, 15.2% from 1998 to 2003, and 21.2% from 2004 to 2007. The mean diameter of benign and malignant tumors was 3.0 and 3.5 cm, respectively, and the mean tumor diameter significantly decreased during the study period ($P = .006$). Using multivariate analysis, the year of surgery, tumor diameter, and female sex were independent predictors of benign histologic features ($P < .05$). Age, incidental diagnosis, body mass index, and race were not significant predictors ($P > .05$). **CONCLUSIONS:** Even when controlling for tumor diameter and sex, the incidence of benign tumors detected at renal surgery at our institution has increased significantly in the past 2 decades.

Narita, D., E. Seclaman, et al. "Expression of CCL18 and interleukin-6 in the plasma of breast cancer patients as compared with benign tumor patients and healthy controls." Rom J Morphol Embryol. 2011;52(4):1261-7.

A growing body of laboratory research has shown that pro-inflammatory cytokines can facilitate tumor growth and metastasis. Our goal was to quantify the expression of CCL18 and IL-6 in patients with breast cancer compared with benign breast tumors patients and healthy women, in order to evaluate if these cytokines could serve for breast cancer diagnosis and evaluation. We also correlated the cytokines level of expression with some clinical and pathological characteristics known as prognostic markers for breast cancer. Plasma samples were obtained before treatment from 58 breast cancers, 41 benign breast tumors and 30 healthy women. The quantitative dosage was performed using ELISA. Wilcoxon test was used to compare groups. IL-6 and CCL18 were dramatically upregulated in breast cancers in comparison with healthy controls, but in comparison with benign tumors only CCL18/PARC was overexpressed at borderline significance in cancers ($p=0.05$). The plasma from benign breast tumor patients exhibited also significant higher levels of the two cytokines than normal controls. The cytokines profile was not linked to patient age, tumor size, histopathological type, lymph node status or histological grade. IL-6 was significantly upregulated in ER-positive and metastasized cancers. CCL18/PARC presented a significantly higher expression in advanced stage and highly proliferative carcinomas. In summary, IL-6 and CCL18 could clearly distinguish between women with breast cancers and healthy controls. High expression of IL-6 seems to confer a poor prognosis for ER-positive

cancers. CCL18 was associated with worse prognosis parameters like high Ki67.

Patrzyk, M., A. Glitsch, et al. "Single-port versus standard laparoscopic resection for a gastric benign tumor in gastroscopic-laparoscopic rendezvous procedures using a laser-supported diaphanoscopy." Surg Laparosc Endosc Percutan Tech. 2013 Aug;23(4):400-5. doi: 10.1097/SLE.0b013e31828e3fe1.

In this study, the standard laparoscopic technique versus the single-port approach was evaluated for the excision of benign gastric tumors using tissue-sparing laser-supported diaphanoscopy for localization. The first group consisted of 10 patients suffering from benign gastric tumors treated by standard laparoscopic resection. The second group included 10 patients treated using the single-port technique. All procedures were successfully completed. Histopathologic examination confirmed 15 cases of gastrointestinal stromal tumor, 3 cases of lipoma, 1 case of leiomyoma, and 1 case of high-grade dysplasia. There was no statistically significant difference for the operation times between both groups. Comparison of the largest and smallest resection margins achieved using the standard laparoscopic technique and single-port techniques showed no statistically significant differences between the groups. During follow-up, all patients were evaluated using the total body image and cosmesis questionnaire. Although scores of all body-image functions were similar, independent of laparoscopic technique, scores of all cosmetic functions in patients operated using the single-port technique showed a statistically significant higher degree of satisfaction with the scar ($P<0185$). The postoperative pain scores evaluated by the visual analog scale score were not significantly different between 2 groups. The single-port technique was found to be a feasible option for the resection of submucosal or mucosal tumors. However, this method is not intended to replace standard laparoscopic resections.

Rea, J. L. "Partial parotidectomies: morbidity and benign tumor recurrence rates in a series of 94 cases." Laryngoscope. 2000 Jun;110(6):924-7.

OBJECTIVES: Review the methods available for parotidectomy. Describe the technique of partial parotidectomy assisted by evoked electromyographic nerve location and the expected morbidity and benign and low-grade cancer tumor recurrence rates from this modified procedure. **STUDY DESIGN:** From 1983 to 1999 the author performed or assisted in 94 parotidectomies (79 partial), all done by a single specialty group and all using evoked electromyographic nerve location. The

cases were surveyed by reviewing all the hospital and office records on these cases and tabulating the type and extent of surgery, pathology, postoperative problems recorded, and long-term follow-up. METHODS: Partial parotidectomy was elected in those cases of benign and low-grade malignant disease in which adequate tumor removal required a less than complete lobectomy or total parotidectomy. Heavy reliance was placed on proactive nerve location by an evoked electromyographic device with dissecting/stimulating hemostat. A retrospective review focusing on these cases was performed based on the patient charts and their continued documentation by the practice. RESULTS: In 79 partial parotidectomies there were no documented facial nerve injuries and one incidence of recurrence of a benign mixed tumor and an acinic cell carcinoma, respectively.

Riesz, P., E. Szekely, et al. "[Can inverted papilloma in urinary bladder be considered as a benign tumor]." *Orv Hetil.* 2010 Jan 17;151(3):92-5. doi: [10.1556/OH.2010.28754](https://doi.org/10.1556/OH.2010.28754).

Inverted papilloma of the urinary bladder is a rare entity. According to literature data, this disease is not malignant, and has low recurrence rate. Authors studied cases detected at the Urology Department and Urooncological Centrum at Semmelweis University in the last 11 years. They aimed to find out the rate of inverted papilloma recurrences, and transformations into malignant bladder cancer. MATERIALS AND METHODS: Thirty patients with histologically proven inverted papilloma were followed after transurethral resection of bladder, which meant urine tests every three months, abdominal ultrasound and cystoscopy. After a year, these examinations were done in every six months. RESULTS: Three patients presented transitiocellular carcinoma (17, 60, 92 months later) during this period. In one case, inverted papilloma and transitiocellular tumor (pTa G1) were detected. In one patient, inverted papilloma was found by control cystoscopy after transurethral resection of bladder (pT1 G2) and local chemotherapy 15 months later. CONCLUSIONS: Based on authors' experience, inverted papilloma of the urinary bladder is a benign lesion, but malignant changes or concomitant transitiocellular tumor may occur, thus follow-up is needed. Although references are not standardized, authors suggest following patients with inverted papilloma as a primary (pTa G1) bladder cancer.

Rosu, S., C. Neamtu, et al. "Unusual lesion of the temporal region, benign tumor of the Chievitz's organ: a case report." *Rom J Morphol Embryol.* 2014;55(2 Suppl):683-5.

Normally present in the temporal region, the juxtaoral organ of Chievitz has considerable importance for both the surgeon and the pathologist. Although very rare, the nodular hyperplasia of the Chievitz's organ has been misinterpreted as invasive carcinoma. The pathological aspect mimics the mucoepidermoid carcinoma, squamous carcinoma, basal cell carcinoma with sebaceous differentiation or tumor of the skin appendages. We present the case of a 71-year-old patient admitted with temporal tumor. The initial pathological diagnosis was mixed squamous basal cell carcinoma. The subsequent evaluation of sections and immunohistochemistry allowed us to demonstrate a benign tumor of the Chievitz's organ. In this case, therapy and prognosis are strongly related to the correct diagnosis and avoid an over treatment of a benign tumor.

Royce, L. S., G. R. Martin, et al. "Induction of an invasive phenotype in benign tumor cells with a laminin A-chain synthetic peptide." *Invasion Metastasis.* 1992;12(3-4):149-55.

K-1735 clones 10 and M2 are cell lines cloned from a UV-induced murine melanoma. While both lines are highly tumorigenic, only the M2 cells are highly invasive in vitro and metastatic in vivo. Here we have exposed the clone 10 cells to the synthetic peptide PA22-2, which contains the IKVAV sequence from the A chain of laminin and which, like laminin, induces collagenase IV production and enhances metastasis formation by B16F10 cells. Zymogram analysis of conditioned media from clone 10 cells cultured on the peptide demonstrated a dose-dependent increase in collagenase IV activity. When clone 10 cells were cultured on a reconstituted basement membrane (Matrigel), this peptide caused an invasive phenotype comparable to the M2 cells. The invasive clone 10 cells were, however, unable to form lung colonies in vivo in the presence of this peptide.

Rutkowski, J. L., K. Wu, et al. "Genetic and cellular defects contributing to benign tumor formation in neurofibromatosis type 1." *Hum Mol Genet.* 2000 Apr 12;9(7):1059-66.

Neurofibromatosis type 1 (NF1) is a common inherited cancer predisposition syndrome. The NF1 gene product, neurofibromin, is hypothesized to function as a tumor suppressor and nearly all NF1 patients develop benign peripheral nerve tumors. These neurofibromas presumably arise from NF1 inactivation in S100(+) Schwann cells, but there is no formal proof for this mechanism. We demonstrate that fibro-blasts isolated from neurofibromas carried at least one normal NF1 allele and expressed both NF1 mRNA and protein, whereas the S100(+) cells typically lacked the NF1 transcript. Our findings

further indicate that additional molecular events aside from NF1 inactivation in Schwann cells and/or other neural crest derivatives contribute to neurofibroma formation.

Sadick, H., M. Huber, et al. "Endoscopic forehead approach for minimally invasive benign tumor excisions." *JAMA Facial Plast Surg.* 2014 Sep-Oct;16(5):352-8. doi: 10.1001/jamafacial.2014.269.

IMPORTANCE: Direct transcutaneous resection has been a widely accepted standard for the removal of benign forehead lesions. In recent years, the endoscopic approach has become more prevalent because of its noninvasiveness. To date, only a few studies with limited case numbers have reported on this technique. We report our findings from one of the largest cohorts of patients undergoing tumor resection of the forehead via the endoscopic approach. **OBJECTIVES:** To evaluate results of the endoscopic forehead approach for benign tumor excisions, to give a more nuanced insight into this procedure, and to discuss technical pearls and potential pitfalls from our experience. **DESIGN, SETTING, AND PARTICIPANTS:** Multicenter, retrospective case study at 2 university centers and 1 private practice among 36 patients aged 18 to 72 years (mean age, 44 years) who underwent the endoscopic forehead approach for benign tumor resections. **MAIN OUTCOMES AND MEASURES:** Symptoms at presentation, surgical procedure and duration, type of lesions, intraoperative and postoperative complications, recurrences, and patient satisfaction. **RESULTS:** In total, 34 patients had an asymptomatic forehead mass, while 2 patients reported discomfort and headache. Among all patients, complete tumor excision was achieved endoscopically. The mean operative time was 36 minutes. Histopathological examination revealed 18 lipomas, 13 osteomas, 2 dermoid cysts, and 1 bone fragment after previous rhinoplasty. In 2 patients, no specimen was submitted. No hematomas, infections, scalp numbness, contour irregularities, temporal branch paralysis, or tumor recurrences occurred. One patient had a prolonged area of alopecia, which resolved on its own. All patients attested to a high satisfaction rate.

Seili-Bekafigo, I., N. Jonjic, et al. "Additional cytomorphological criteria in diagnosis of pilomatricoma--benign tumor with bad reputation." *Coll Antropol.* 2010 Mar;34(1):117-22.

Pilomatricomas (PM) are benign skin appendageal tumors, with differentiation towards hair-forming cells, usually found in children. They are frequently misdiagnosed by clinicians, and there are also many reports of false positive diagnoses made on fine needle aspiration (FNA) cytology. PM are often

mistaken for "small round blue cell" tumors in children, or for Merkel cell carcinoma, basalioma and metastatic small cell carcinoma in adults, with possible over-aggressive therapeutic approach. We present 6 cases of PM, correctly diagnosed preoperatively by FNA. Clinical, cytomorphologic and basic morphometric features were analyzed, and compared with 4 cases of malignant tumors with similar clinical presentation. Morphometric data (longest nuclear diameter) did not prove to be helpful, while basophilic cytoplasmic protrusions, observed in all 6 analyzed cases, could be useful additional cytomorphologic feature of PM. We concluded that cytomorphologic characteristics of PM are reliable enough for correct preoperative diagnosis in adequate specimens, however the best results are achieved when FNA is performed by an experienced cytologist, and when all relevant clinical data are obtained.

Siminas, S., E. Qasem, et al. "Inflammatory fibroid polyp: a rare benign tumor of the alimentary tract in children presenting as intussusception-case report and review of literature." *European J Pediatr Surg Rep.* 2014 Jun;2(1):16-9. doi: 10.1055/s-0033-1354746. Epub 2013 Sep 9.

Inflammatory fibroid polyp (IFP) represents a rare cause of gastrointestinal polypoid disease in childhood. Tauhe lesion has been described by various names beyond the currently accepted term, including "Vanek's tumour," eosinophilic or submucosal granuloma, gastric fibroma with eosinophilic infiltration, inflammatory pseudotumor, and hemangiopericytoma. The etiopathogenesis and origin of the mesenchymal spindle-shaped cells that comprise the polyp remains enigmatic. Recent studies have shown familial occurrence, expression of platelet-derived growth factor receptor (PDGFRA) and oncogenic PDGFRA mutations in the majority of lesions, suggestive of a neoplastic nature. We present a rare case of a 10-year-old boy with an IFP of the terminal ileum, who presented acutely with intussusception and was treated with a right hemicolectomy. Postoperative course was uneventful and the patient has been asymptomatic during follow-up. Histopathology and immunohistochemical analysis excluded inflammatory myofibroblastic tumor (negative for Alk1, desmin, smooth muscle actin [SMA]), gastrointestinal stromal tumors (GIST) (negative for CD117) and schwannoma (negative for S100).

Stamatiou, K. "Urinary retention due to benign tumor of the bladder neck in a woman; a rare case of papillary cystitis." *Urologia.* 2013 Jan-Mar;80(1):83-5. doi: 10.5301/RU.2013.10716. Epub 2013 Feb 5.

BACKGROUND: Urinary retention (UR) is not common in women. There are numerous causes now recognized in women, broadly categorized as infective, pharmacological, neurological, anatomical, myopathic and functional. As opposed to the male, obstructive UR is unusual in women. **METHODS:** A 56-year-old woman presented with urinary retention. She reported difficulty in urination for more than 15 days. She had no history of urinary tract infection, bladder surgery and catheterization. Her physical examination revealed a soft tissue mass obstructing the external orifice of the urethra. After its partial removal the patient regained her ability to urinate. **RESULTS:** The patient underwent urological investigation. Ultrasound examination of the urinary system was normal. Cystoscopic examination revealed a papillary lesion with broad base floating along the bladder neck. The patient underwent transurethral resection of the bladder tumor. **DISCUSSION:** Pathological examination diagnosed papillary cystitis. She was scheduled for a regular follow-up with urine cytology, ultrasound and cystoscopy. One year after diagnosis the patient remains free of symptoms and no recurrence was observed. **CONCLUSIONS:** Papillary and polypoid cystitis are benign lesions, however under certain circumstances they should be considered in the differential diagnosis of transitional cell carcinoma of the bladder. Lack of the prominent inflammation and edema that characterizes both papillary and polypoid cystitis, and absence of a history of recent bladder catheterization and presence of vesical fistula may facilitate the decision to biopsy the lesion. To our knowledge, this is the first case of papillary cystitis presenting with urinary retention in a woman to be reported in the literature.

Studer, H. "[Goiter: from epiphenomenon of iodine deficiency to benign tumor. A 30-year long guided story]." Schweiz Med Wochenschr. 1995 Jul 22;125(29):1379-87.

Thirty years ago, iodine deficiency was highly prevalent in Switzerland and, consequently, few people doubted that shortage of this element fully accounted for the very high incidence of nodular goiters. Most research efforts were aimed at unraveling the mechanisms that allowed the thyroid to maintain adequate hormone production - at the expense of goiter formation - despite insufficient iodine supply. In 1982 iodine deficiency was eradicated in this country, a remarkable achievement of preventive medicine. Although the incidence of goiter dramatically decreased thereafter, this thyroid disease has remained and still is a common problem. Only now has it become clear that factors other than or in addition to iodine shortage must be operative in goitrogenesis and that classical features, such as the

tremendous functional and morphological heterogeneity of goitrous tissue, and, in particular, the growth of nodules, must result from causes and mechanisms that are common to the pathological growth of other tissues too. Subsequently, the thyroid has become a rewarding source of information about cellular and - more recently - molecular events that accompany and might possibly cause pathological growth. Today, thyroid nodules are considered to be true monoclonal and polyclonal tumors. Hence, we no longer wonder why eradication of iodine shortage cannot totally prevent or reverse goiter growth. - While modern molecular biology unravels - at an amazing pace - the mechanisms that cause heterogeneity between individuals of a single species, goitrogenesis offers a unique opportunity to go one step beyond, which is the inborn and acquired heterogeneity between the individual cells of the same tissue.(ABSTRACT TRUNCATED AT 250 WORDS)

Syrjanen, K. and S. Syrjanen "Solitary bronchial squamous cell papilloma - another human papillomavirus (HPV)-associated benign tumor: systematic review and meta-analysis." Contemp Oncol (Pozn). 2013;17(5):427-34. doi: 10.5114/wo.2013.38565. Epub 2013 Nov 14.

AIM OF THE STUDY: To perform a systematic review and formal meta-analysis of the literature reporting on HPV detection in bronchial squamous cell papillomas (SCP). **MATERIAL AND METHODS:** The literature was searched up to June 2012. The effect size was calculated as event rate (95% CI), with homogeneity testing using Cochran's Q and I(2) statistics. Meta-regression was used to test the impact of study-level covariates (HPV detection method, geographic origin) on effect size, and potential publication bias was estimated using funnel plot symmetry. **RESULTS:** Fifteen studies were eligible, covering 89 bronchial SCPs from different geographic regions. Altogether, 38 (42.7%) cases tested HPV-positive; effect size 0.422 (95% CI: 0.311-0.542; fixed effects model), and 0.495 (95% CI: 0.316-0.675; random effects model). In meta-analysis stratified by i) HPV detection technique and ii) geographic study origin, the between-study heterogeneity was not significant for either; $p = 0.348$, and $p = 0.792$, respectively. In maximum likelihood meta-regression, HPV detection method ($p = 0.150$) and geographic origin of the study ($p = 0.164$) were not significant study-level covariates. Some evidence for publication bias was found only among in situ hybridization (ISH)-based studies and among studies from Europe, but with a negligible effect on summary effect size estimates. In sensitivity analysis, the meta-analytic results were robust to all one-by-one study removals.

Venkatesh, K., M. L. Saini, et al. "Neural fibrolipoma without macrodactyly: a subcutaneous rare benign tumor." *J Cutan Pathol.* 2009 May;36(5):594-6. doi: 10.1111/j.1600-0560.2008.01088.x. Epub 2008 Mar 30.

Neural fibrolipoma, also known as lipofibromatous hamartoma of nerves and neurolipomatosis, is a rare subcutaneous benign lesion involving the upper extremity with a marked predilection for median nerve. In one-third of the cases, it is associated with macrodactyly (enlargement of one or several digits of hands or feet), diminished sensation, paraesthesias and compression neuropathy. A 23-year-old male presented with a gradually increasing mass in the right palm without associated macrodactyly or neurodeficit. The surgical specimen showed a 20 x 18 x 3 cm, grey yellow fusiform mass. Cut section revealed presence of fibrofatty tissue within and around the enlarged nerve. Microscopy established the relation of nerve enlargement to infiltration of epineurium and perineurium by fibroadipose tissue separating normal nerve fascicles. Limited excision was the mainstay of conservative treatment. Neural fibrolipomas are a rare entity. Knowledge of characteristic histological and radiological findings is necessary for diagnosis and treatment.

Verna, C. and K. W. Min "Intramuscular hemangioma: a benign tumor masquerading as malignant soft tissue tumor. Report of two cases." *J Okla State Med Assoc.* 1999 Jan;92(1):21-3.

We report two cases of intramuscular hemangiomas, one arising from the left flank region of a 33-year-old female, and another from the mid right back of a 25-year-old man. In both cases the tumor masqueraded as malignancy and required a biopsy for correct diagnosis. Intramuscular hemangioma is a benign vascular tumor. Its tendency to deep location, infiltrative border, and fixity to surrounding tissues may cause it to be confused with malignant soft tissue tumors. Preoperative biopsy of the lesion is advised, and histopathologic examination is the only way to make a definitive diagnosis. Wide excision of the lesion is the treatment of choice. Follow up is required for any late recurrences.

Vilallonga, R., E. Espin Basany, et al. "Cavernous hemangioma: unusual benign tumor of the transverse colon." *Turk J Gastroenterol.* 2009 Jun;20(2):146-9.

Cavernous hemangioma of the colon is an uncommon disease and a rare cause of bleeding. Few cases have been reported in the literature. The rectosigmoid is the most common site of this disease in the gastrointestinal tract, while colonic localization

is very uncommon. We report the case of a 66-year-old female with recurrent episodes of rectal bleeding. She underwent a colonoscopy and was diagnosed with diffuse cavernous hemangioma of the transverse colon. A laparoscopic extended right hemicolectomy was performed. Colonic hemangiomas are very rare vascular malformations and their clinical presentation is usually acute, recurrent or chronic rectal bleeding. This tumor can be diagnosed as solitary, multiple, or part of a more complex syndrome with cutaneous manifestations. They can also invade adjacent structures. Colonoscopy is a useful diagnostic test. The extension of the lesion, its morphology and its localization can be established, but imaging such as magnetic resonance or computerized tomography scan has to be performed. Sometimes, however, recognition of these tumors is difficult and can be a cause of failed surgical treatment and severe complications. Surgical treatment is recommended, after a full diagnostic evaluation for other causes of gastrointestinal bleeding.

Volpe, J. P. "Genetic instability of cancer. Why a metastatic tumor is unstable and a benign tumor is stable." *Cancer Genet Cytogenet.* 1988 Aug;34(1):125-34.

It is theorized that tumors may be initiated by two methods: by an error affecting one or several oncogenes, or by an error affecting one or several of the genes controlling the stability of the genome. The majority of cells that misexpress an oncogene(s) and that later form a tumor probably form nonevolving benign tumors. A minority of these cells with an activated oncogene(s) (or one of the descendant cells) may also come to misexpress a stability gene(s). A normal cell that misexpresses only a stability gene(s) may form an evolving and genetically unstable cell line that may later misexpress an oncogene(s). A cell or cell line that misexpresses both an oncogene(s) and a stability gene(s) may form a genetically unstable tumor that creates diverse variants, allowing for extensive tumor cell evolution and the acquisition of malignant and metastatic properties.

Wang, B., J. Wang, et al. "[Application of maxillary bone eversion reduction on benign tumor in nasal cavity and paranasal sinus invading the skull base]." *Zhonghua Er Bi Yan Hou Ke Za Zhi.* 1998 Dec;33(6):356-7.

OBJECTIVE: To investigate the operative methods for benign tumors in nasal cavity and paranasal sinus invading the skull base. METHODS: Six cases of benign tumors in nasal cavity and paranasal sinus invading the skull base were reported. Of them, 3 were ossifying fibromas, 1 osteoma, 1 osteochondroma and 1 giant osteoid osteoma. The

tumors were removed by combined approaches through unilateral maxillary bone eversion reduction. RESULTS: No complication was found. Follow-up was made 2-3 years after operation. Five cases were uneventful, 1 had a relapse of tumor but still alive. CONCLUSIONS: The method is appropriate for treating benign tumors in nasal cavity and paranasal sinus invading the skull base.

Yasuda, S., S. Wada, et al. "Tumor-induced osteomalacia: benign tumor recurrence after two surgical resections at two different medical institutions." Endocr Pract. 2013 Jul-Aug;19(4):e97-101. doi: 10.4158/EP13042.CR.

OBJECTIVE: To describe an exceedingly rare case of tumor-induced osteomalacia (TIO) caused by a benign phosphaturic mesenchymal tumor that recurred after two surgical resections at two different medical institutions. METHODS: A 69-year-old man complained of a 3-year history of persistent whole body pain and presented with hypophosphatemia, elevated serum levels of bone-specific alkaline phosphatase and fibroblast growth factor-23 (FGF-23), and multiple fractures. The patient was suspected of having TIO. We conducted the following diagnostic modalities considered useful to detect the tumor: serum FGF-23 level measurement in the extremities, positron emission tomography (PET)-computed tomography (CT), and magnetic resonance imaging (MRI). RESULTS: The causative tumor could be detected in the right humerus not by venous catheterization for serum FGF-23 level measurement but by the combination of PET-CT and MRI. The authors, who had successfully treated two patients with TIO, visually confirmed the absence of any tumor residue during tumorectomy. Nevertheless, the tumor recurred after surgery.

Yazici, P., U. Aydin, et al. "Hamartoma - a rare benign tumor of the spleen: a report of four cases." Eurasian J Med. 2008 Apr;40(1):48-51.

Splenic hamartoma is an uncommon benign tumor. We retrospectively analyzed all patients who underwent splenectomy between May 2000 and June 2006 and four cases of splenic hamartoma were encountered. Three patients presented with mild abdominal pain. Abdominal ultrasonography was the first diagnostic step, which revealed a splenic mass. Doppler ultrasonography, computed tomography, and magnetic resonance were among the other diagnostic methods. An elective splenectomy was performed for all of the cases. Splenic hamartoma must be considered in the differential diagnosis of splenic masses unrelated to any other malignancy. Elective splenectomy is indicated due to hematological

disorders or symptoms of pain and appreciation of the mass.

Yoshihama, K., Y. Kato, et al. "Xanthogranuloma of the external auditory canal mimicking a benign tumor: a case report." Case Rep Otolaryngol. 2012;2012:298089. doi: 10.1155/2012/298089. Epub 2012 Jul 2.

Exostosis, osteoma, and adenoma are the most commonly encountered benign lesions in the external auditory canal. Herein, we report a case of the mass arising from the external auditory canal in a 24-year-old Japanese man. CT revealed the soft tissue mass without bony erosion, and MRI revealed that the mass showed a homogenous, iso signal intensity on a both T1- and T2-weighted image, suggesting that the mass is a benign tumor such as adenoma. Pathological examination showed that the specimen demonstrated xanthogranuloma in the external auditory canal. Although xanthogranuloma of the external auditory canal is extremely rare, otolaryngologists should recognize this condition during the inspection of the external auditory canal.

Zarbis, N., T. F. Barth, et al. "Pecoma of the lung: a benign tumor with extensive 18F-2-deoxy-D-glucose uptake." Interact Cardiovasc Thorac Surg. 2007 Oct;6(5):676-8. Epub 2007 Jun 7.

A case of lung pecoma (i.e. tumors showing perivascular epithelioid cell differentiation) with extensive 18F-2-deoxy-D-glucose (FDG) uptake in PET/CT study is reported. Pecomomas of the lung--which include the better known clear cell 'sugar' tumor--are a subset of extremely rare lung tumors which usually react positively to both melanocytic and smooth muscle markers. Although widely presumed as benign in computed tomography (CT) and positron emission tomography (PET)/CT studies they depict as malignant, thus complicating the preoperative diagnosis. A subset of pecomomas could conceal a malignant potential.

Zusman, I., R. Zusman, et al. "IgG generated against benign tumor-associated antigens prevented the effects of 1,2-dimethylhydrazine in rats." Anticancer Res. 1996 May-Jun;16(3A):1183-6.

We showed the possibility of significant decreasing of the frequency of chemically induced colon cancer in rats by vaccination with polyclonal rabbit IgG generated against purified tumor-associated antigens (TAA). TAA were isolated from benign rat colon tumors by the method developed in our laboratory (Zusman et al 1994) using affinity chromatography columns with gel fiberglass membranes (R. Zusman, 1992) containing anti-tumor IgG. The IgG was isolated from rabbits following

their vaccination with TAA. Sprague Dawley rats were vaccinated with anti-TAA IgG (100 micrograms/rat) suspended in Freund's adjuvant by weekly subcutaneous injections for 5 weeks. The induction of colon cancer was caused by weekly injections with 1,2-dimethylhydrazine (DMH) (20 mg/kg) for 7 weeks and was started one week after the end of the vaccination. The results of experiments were evaluated 6 months after the start of cancer induction. IgG protected against the carcinogenic effects of DMH. The number of tumor-bearing rats decreased to 64% as compared with 90% in the control group. In vaccinated rats, the incidence of tumors was almost 3 times less than of control, i.e. 3.6 and 9.3, respectively. The number of malignant tumors was also significantly smaller in vaccinated rats than in controls, being 24% and 58%, respectively. Metastases were found only in controls, 4 of 30 rats. The results of our experiments have shown that anti-TAA IgG not only has anti-tumor effects but also prevents the malignization of benign tumors. As one of the main components of TAA which was isolated from colon cancer rats was soluble p53 antigen (Zusman et al 1994), we suggest that the vaccine which has been generated in our experiments may be regarded as acting mainly against p53 antigen, and its antitumor effects should also be considered as effects of p53 antibodies. The further studies will be performed to clarify this.

Zwetyenga, N., M. Audion, et al. "[Quality of life after primary parotidectomy for benign tumor]." *Rev Stomatol Chir Maxillofac Chir Orale*. 2015 Feb;116(1):18-22. doi: 10.1016/j.revsto.2014.04.006. Epub 2015 Jan 13.

INTRODUCTION: Parotidectomy is commonly performed for various indications, including benign tumors of the parotid region. Esthetic or functional sequels of various importance and lasting effects may occur, as after any surgical procedure. These disorders may impact the patient's quality of life. The authors retrospectively evaluated the long-term outcome of patients having undergone conservative primary parotidectomy for a benign tumor, with a minimum follow-up of 10 years. **PATIENTS AND METHODS:** A hundred and twenty-six superficial conservative primary or secondary parotidectomies were performed during 5 years, 94 (74.6%) of which for benign tumors. A flap of the sternocleidomastoid muscle (SCM) was inserted between the skin and facial nerve branches to prevent Frey's syndrome and alleviate surgical site depression according to some criteria. Questionnaires were completed at least 10 years after surgery. **RESULTS:** The data of 53 patients was analyzed. 88.7% of patients had undergone a superficial parotidectomy

and 11.3% a total one. The average histological tumor size was 3.3 cm (2.6 to 6.3 cm). The tumors were distributed as follows: pleomorphic adenoma in 79.4% of patients, cystadenolymphoma in 15.1%, oncocytoma in 3.7%, and basal cell adenoma in 1.8%. Twenty-six SCM flaps (49.1%) were performed. No patient presented with facial paresis or facial paralysis at the end of the study. The average follow-up was 10.4 years (10-11 years). Overall, social, psychological, and professional implications were reported by 7.5% of patients, and in 1.8% of cases the impact was significant. The use of a SCM flap seemed to prevent Frey's syndrome (Fischer test $P=0.00001$) and improved cosmetic results (Fisher test $P<0.00001$). **DISCUSSION:** Conservative parotidectomy for primary benign tumors has a limited impact on the quality of life in the long run. This impact concerned 7.4% of patients. There was a significant impact in 2% of patients. We recommend filling the surgical site to improve functional and esthetic results and decrease long-term effects on the patient's quality of life.

The above contents are the collected information from Internet and public resources to offer to the people for the convenient reading and information disseminating and sharing.

References

1. Adam, C., M. Polivka, et al. "Papillary glioneuronal tumor: not always a benign tumor?" *Clin Neuropathol*. 2007 May-Jun;26(3):119-24.
2. Ballarini, C., M. Intra, et al. "Gastrointestinal stromal tumors: a "benign" tumor with hepatic metastasis after 11 years." *Tumori*. 1998 Jan-Feb;84(1):78-81.
3. Barajas, R. F., Jr., A. Perry, et al. "Intracranial subdural osteoma: a rare benign tumor that can be differentiated from other calcified intracranial lesions utilizing MR imaging." *J Neuroradiol*. 2012 Oct;39(4):263-6. doi: 10.1016/j.neurad.2011.11.003. Epub 2011 Dec 23.
4. Bardisi, E. S., N. Alghanmi, et al. "Primary mucosa-associated lymphoid tissue lymphoma of the esophagus masquerading as a benign tumor." *Ann Med Surg (Lond)*. 2014 May 20;3(2):39-42. doi: 10.1016/j.amsu.2014.05.001. eCollection 2014 Jun.
5. Barman, S., K. C. Mandal, et al. "Adrenal myelolipoma: An incidental and rare benign tumor in children." *J Indian Assoc Pediatr Surg*. 2014 Oct;19(4):236-8. doi: 10.4103/0971-9261.142019.
6. Baron Toaldo, M., A. Diana, et al. "Imaging diagnosis-cholangiocellular adenoma: contrast-enhanced ultrasonographic findings of a benign tumor mimicking malignant neoplasia in a dog." *Vet Radiol Ultrasound*. 2013 Jan-Feb;54(1):71-4. doi: 10.1111/j.1740-8261.2012.01991.x. Epub 2012 Oct 24.
7. Beall, C., E. Delzell, et al. "Cancer and benign tumor incidence among employees in a polymers research complex." *J Occup Environ Med*. 2001 Oct;43(10):914-24.

8. Biswas, P. K., J. Niu, et al. "Numerical simulation and graphical analysis of in vitro benign tumor growth: application of single-particle state bosonic matter equation with length scaling." J Mol Model. 2006 Jul;12(5):641-8. Epub 2006 Mar 23.
9. Bydon, A., J. A. Gutierrez, et al. "Meningeal melanocytoma: an aggressive course for a benign tumor." J Neurooncol. 2003 Sep;64(3):259-63.
10. Chavez Martinez, S., M. L. Arias Gonzalez, et al. "[Cotyledonoid dissecting leiomyoma of the uterus. A malignant-looking benign tumor]." Ginecol Obstet Mex. 2012 Aug;80(8):528-33.
11. Constancis, P., G. Arvis, et al. "[Primary solid tumors of the epididymis. Apropos of 4 cases of benign tumor and one case of malignant mesothelioma]." Ann Urol (Paris). 1987;21(6):387-90.
12. Cornette, J., S. Festen, et al. "Mesenchymal hamartoma of the liver: a benign tumor with deceptive prognosis in the perinatal period. Case report and review of the literature." Fetal Diagn Ther. 2009;25(2):196-202. doi: 10.1159/000212057. Epub 2009 Apr 9.
13. de Lima Junior, M. M., C. B. Sampaio, et al. "Leiomyoma--a rare benign tumor of the female urethra: a case report." J Med Case Rep. 2014 Nov 13;8:366. doi: 10.1186/1752-1947-8-366.
14. De Nictolis, M., G. Goteri, et al. "Elastofibrolipoma of the mediastinum. A previously undescribed benign tumor containing abnormal elastic fibers." Am J Surg Pathol. 1995 Mar;19(3):364-7.
15. Demirhan, O., S. Ozkara, et al. "A rare benign tumor of the lung: Inflammatory myofibroblastic tumor - Case report." Respir Med Case Rep. 2013 Feb 4;8:32-5. doi: 10.1016/j.rmcr.2013.01.001. eCollection 2013.
16. Figarella-Branger, D., H. Dufour, et al. "Pituicytomas, a mis-diagnosed benign tumor of the neurohypophysis: report of three cases." Acta Neuropathol. 2002 Sep;104(3):313-9. Epub 2002 Jun 19.
17. Frischenschlager, O., B. Balogh, et al. "[Psychosocial effects of plastic surgery reconstruction of the female breast following amputation for malignant/benign tumor]." Psychother Psychosom Med Psychol. 1990 Nov;40(11):441-7.
18. Hendriks, M. P., C. M. Driessen, et al. "Aggressive fibromatosis in the head and neck region: Benign tumor with often mutilating effects." Head Neck. 2013 Aug;35(8):E246-50. doi: 10.1002/hed.23092. Epub 2012 Aug 21.
19. Henriksen, R., F. B. Sorensen, et al. "Expression of FK506 binding protein 65 (FKBP65) is decreased in epithelial ovarian cancer cells compared to benign tumor cells and to ovarian epithelium." Tumour Biol. 2011 Aug;32(4):671-6. doi: 10.1007/s13277-011-0167-4. Epub 2011 Mar 12.
20. Joseph, J., D. Ritchie, et al. "Bizarre parosteal osteochondromatous proliferation: a locally aggressive benign tumor." Clin Orthop Relat Res. 2011 Jul;469(7):2019-27. doi: 10.1007/s11999-011-1898-7. Epub 2011 Apr 30.
21. Kaddoura, I. and G. Zaatari "Fibro-osseous pseudotumor of the thenar eminence: a rare aggressive but benign tumor." Ann Plast Surg. 2009 Mar;62(3):326-8. doi: 10.1097/SAP.0b013e31817e9d35.
22. Kalkanis, A., M. Trianti, et al. "A clear cell tumor of the lung presenting as a rapidly growing coin lesion: is it really a benign tumor?" Ann Thorac Surg. 2011 Feb;91(2):588-91. doi: 10.1016/j.athoracsur.2010.07.043.
23. Karthikeyan, P. and P. Paulraj "An unusual benign tumor of pinna - A case report." Indian J Otolaryngol Head Neck Surg. 2010 Jun;62(2):195-7. doi: 10.1007/s12070-010-0022-8. Epub 2010 Sep 24.
24. Kawashima, Y., A. C. Campos, et al. "Ability of a benign tumor to decrease spontaneous food intake and body weight in rats." Cancer. 1989 Feb 15;63(4):693-9.
25. LeMaire, W. J., C. Kreiss, et al. "Neurilemmoma: an unusual benign tumor of the cervix." Alaska Med. 2002 Jul-Sep;44(3):63-5.
26. Lemesle, M., J. P. Borsotti, et al. "[Dysembryoplastic neuroepithelial tumors. A benign tumor cause of partial epilepsy in young adults]." Rev Neurol (Paris). 1996 Jun-Jul;152(6-7):451-7.
27. Ma H, Chen G. Stem cell. The Journal of American Science 2005;1(2):90-92.
28. Ma H, Cherng S. Eternal Life and Stem Cell. Nature and Science. 2007;5(1):81-96.
29. Ma H, Cherng S. Nature of Life. Life Science Journal 2005;2(1):7 - 15.
30. Ma H, Yang Y. Turritopsis nutricula. Nature and Science 2010;8(2):15-20. http://www.sciencepub.net/nature/ns0802/03_1279_hongbao_turritopsis_ns0802_15_20.pdf.
31. Ma H. The Nature of Time and Space. Nature and science 2003;1(1):1-11. Nature and science 2007;5(1):81-96.
32. Mangioni, S., P. Vigano, et al. "Overexpression of the Wnt5b gene in leiomyoma cells: implications for a role of the Wnt signaling pathway in the uterine benign tumor." J Clin Endocrinol Metab. 2005 Sep;90(9):5349-55. Epub 2005 Jun 21.
33. Mankin, H. J. and K. P. Mankin "Schwannoma: a rare benign tumor of soft tissues." Musculoskelet Surg. 2014 Aug;98(2):95-9. doi: 10.1007/s12306-014-0333-0. Epub 2014 Jun 24.
34. Mautner, V. F., F. A. Asuagbor, et al. "Assessment of benign tumor burden by whole-body MRI in patients with neurofibromatosis 1." Neuro Oncol. 2008 Aug;10(4):593-8. doi: 10.1215/15228517-2008-011. Epub 2008 Jun 17.
35. Murphy, A. M., A. M. Buck, et al. "Increasing detection rate of benign renal tumors: evaluation of factors predicting for benign tumor histologic features during past two decades." Urology. 2009 Jun;73(6):1293-7. doi: 10.1016/j.urology.2008.12.072. Epub 2009 Apr 15.
36. Narita, D., E. Seclaman, et al. "Expression of CCL18 and interleukin-6 in the plasma of breast cancer patients as compared with benign tumor patients and healthy controls." Rom J Morphol Embryol. 2011;52(4):1261-7.
37. National Center for Biotechnology Information, U.S. National Library of Medicine. <http://www.ncbi.nlm.nih.gov/pubmed>. 2015.

38. Patrzyk, M., A. Glitsch, et al. "Single-port versus standard laparoscopic resection for a gastric benign tumor in gastroscopic-laparoscopic rendezvous procedures using a laser-supported diaphanoscopy." *Surg Laparosc Endosc Percutan Tech.* 2013 Aug;23(4):400-5. doi: [10.1097/SLE.0b013e31828e3fe1](https://doi.org/10.1097/SLE.0b013e31828e3fe1).
39. Rea, J. L. "Partial parotidectomies: morbidity and benign tumor recurrence rates in a series of 94 cases." *Laryngoscope.* 2000 Jun;110(6):924-7.
40. Riesz, P., E. Szekely, et al. "[Can inverted papilloma in urinary bladder be considered as a benign tumor]." *Orv Hetil.* 2010 Jan 17;151(3):92-5. doi: [10.1556/OH.2010.28754](https://doi.org/10.1556/OH.2010.28754).
41. Rosu, S., C. Neamtu, et al. "Unusual lesion of the temporal region, benign tumor of the Chievitz's organ: a case report." *Rom J Morphol Embryol.* 2014;55(2 Suppl):683-5.
42. Royce, L. S., G. R. Martin, et al. "Induction of an invasive phenotype in benign tumor cells with a laminin A-chain synthetic peptide." *Invasion Metastasis.* 1992;12(3-4):149-55.
43. Rutkowski, J. L., K. Wu, et al. "Genetic and cellular defects contributing to benign tumor formation in neurofibromatosis type 1." *Hum Mol Genet.* 2000 Apr 12;9(7):1059-66.
44. Sadick, H., M. Huber, et al. "Endoscopic forehead approach for minimally invasive benign tumor excisions." *JAMA Facial Plast Surg.* 2014 Sep-Oct;16(5):352-8. doi: [10.1001/jamafacial.2014.269](https://doi.org/10.1001/jamafacial.2014.269).
45. Seili-Bekafigo, I., N. Jonjic, et al. "Additional cytomorphological criteria in diagnosis of pilomatricoma--benign tumor with bad reputation." *Coll Antropol.* 2010 Mar;34(1):117-22.
46. Siminas, S., E. Qasem, et al. "Inflammatory fibroid polyp: a rare benign tumor of the alimentary tract in children presenting as intussusception-case report and review of literature." *European J Pediatr Surg Rep.* 2014 Jun;2(1):16-9. doi: [10.1055/s-0033-1354746](https://doi.org/10.1055/s-0033-1354746). Epub 2013 Sep 9.
47. Stamatiou, K. "Urinary retention due to benign tumor of the bladder neck in a woman; a rare case of papillary cystitis." *Urologia.* 2013 Jan-Mar;80(1):83-5. doi: [10.5301/RU.2013.10716](https://doi.org/10.5301/RU.2013.10716). Epub 2013 Feb 5.
48. Studer, H. "[Goiter: from epiphenomenon of iodine deficiency to benign tumor. A 30-year long guided story]." *Schweiz Med Wochenschr.* 1995 Jul 22;125(29):1379-87.
49. Syrjanen, K. and S. Syrjanen "Solitary bronchial squamous cell papilloma - another human papillomavirus (HPV)-associated benign tumor: systematic review and meta-analysis." *Contemp Oncol (Pozn).* 2013;17(5):427-34. doi: [10.5114/wo.2013.38565](https://doi.org/10.5114/wo.2013.38565). Epub 2013 Nov 14.
50. Venkatesh, K., M. L. Saini, et al. "Neural fibrolipoma without macrodactyly: a subcutaneous rare benign tumor." *J Cutan Pathol.* 2009 May;36(5):594-6. doi: [10.1111/j.1600-0560.2008.01088.x](https://doi.org/10.1111/j.1600-0560.2008.01088.x). Epub 2008 Mar 30.
51. Verna, C. and K. W. Min "Intramuscular hemangioma: a benign tumor masquerading as malignant soft tissue tumor. Report of two cases." *J Okla State Med Assoc.* 1999 Jan;92(1):21-3.
52. Vilallonga, R., E. Espin Basany, et al. "Cavernous hemangioma: unusual benign tumor of the transverse colon." *Turk J Gastroenterol.* 2009 Jun;20(2):146-9.
53. Volpe, J. P. "Genetic instability of cancer. Why a metastatic tumor is unstable and a benign tumor is stable." *Cancer Genet Cytogenet.* 1988 Aug;34(1):125-34.
54. Wang, B., J. Wang, et al. "[Application of maxillary bone eversion reduction on benign tumor in nasal cavity and paranasal sinus invading the skull base]." *Zhonghua Er Bi Yan Hou Ke Za Zhi.* 1998 Dec;33(6):356-7.
55. Wikipedia. The free encyclopedia. <http://en.wikipedia.org>. 2015.
56. Yasuda, S., S. Wada, et al. "Tumor-induced osteomalacia: benign tumor recurrence after two surgical resections at two different medical institutions." *Endocr Pract.* 2013 Jul-Aug;19(4):e97-101. doi: [10.4158/EP13042.CR](https://doi.org/10.4158/EP13042.CR).
57. Yazici, P., U. Aydin, et al. "Hamartoma - a rare benign tumor of the spleen: a report of four cases." *Eurasian J Med.* 2008 Apr;40(1):48-51.
58. Yoshihama, K., Y. Kato, et al. "Xanthogranuloma of the external auditory canal mimicking a benign tumor: a case report." *Case Rep Otolaryngol.* 2012;2012:298089. doi: [10.1155/2012/298089](https://doi.org/10.1155/2012/298089). Epub 2012 Jul 2.
59. Zarbis, N., T. F. Barth, et al. "Pecoma of the lung: a benign tumor with extensive 18F-2-deoxy-D-glucose uptake." *Interact Cardiovasc Thorac Surg.* 2007 Oct;6(5):676-8. Epub 2007 Jun 7.
60. Zusman, I., R. Zusman, et al. "IgG generated against benign tumor-associated antigens prevented the effects of 1,2-dimethylhydrazine in rats." *Anticancer Res.* 1996 May-Jun;16(3A):1183-6.
61. Zwetyenga, N., M. Audion, et al. "[Quality of life after primary parotidectomy for benign tumor]." *Rev Stomatol Chir Maxillofac Chir Orale.* 2015 Feb;116(1):18-22. doi: [10.1016/j.revsto.2014.04.006](https://doi.org/10.1016/j.revsto.2014.04.006). Epub 2015 Jan 13.