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Review Article

Pathology Section

Food eponyms in Pathology

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ABSTRACT

Pathology is an interesting and often challenging field. In many instances, Pathologists often hunt for clues to arrive at the diagnosis, in dark with a single beam of light. To make this tedious task more acceptable and more convenient, pathological findings are usually compared with food entities commonly used in our day to day life. Here, we have compiled pathological findings compared with certain food entities.

Keywords: Eponymophilia, Metaphorical descriptions, Pathological findings

INTRODUCTION

Food Eponyms

The practice of "eponymophilia" is often common in pathological practice. These eponyms help a pathologist to recognise complex pathological patterns more comfortably. We did a detailed literature searchand have compiled the following commonly used food eponyms.

Ague cake appearance: It was described in 1794 by Richard Shannon to describe enlargement of spleen in association with liver [1], usually connected with Malaria [2].

Almond shaped organ: Gross appearance of normal ovary [3].

Anchovy sauce pus: The odourless brown coloured pus seen in amoebic liver abscess [4].

Apple green birefringence: The birefringence exhibited by amyloid stained by congo red in polarized light [5].

Apple green sputum: The thick green coloured purulent sputum in pneumonia caused by *Haemophilus influenzae* [6].

Apple jelly nodules: Small sharply defined reddish-brown lesions with a gelatinous consistency seen in *Lupus vulgaris* [7].

Banana shaped: The crescent shaped gametocyte of *Plasmodium falciparum* which facilitate the sequestration of early-stage gametocytes and enabling late-stage gametocytes to circulate in the blood stream without being removed by the mechanical filtering mechanisms in the host spleen [8]. The elongated appearance of cerebellum in majority of cases of spina bifida [9].

Berry aneurysm: The saccular aneurysm of the cerebral vessels at the junction of vessels in the circle of Willis [10].

Blue berry muffin baby: Infants with purpura on the trunk, head and neck because of extramedullary dermal haematopoiesis found in infants with congenital infections, TORCH syndrome (toxoplasmosis, other, rubella, *Cytomegalovirus,* herpes) [11], congenital leukemia cutis and neonatal neuroblastoma [12], rhabdomyosarcoma and Langerhans cell histiocytosis [13].

Bread and Butter appearance: The shaggy appearance of the deposition of fibrinous exudate on pericardium due to inflammatory process [14].

Café au lait spots: These are well circumscribed, evenly pigmented macules and patches seen in healthy children and associated with syndromes, commonly neurofibromatosis type 1 [15].

Carrot shaped nuclei: Shape of the nuclei with abundant chromatin and scanty cytoplasm seen in medulloblastoma, an embryonal malignant childhood tumour commonly located in cerebellum [16].

Cauliflower like appearance: Gross appearance of the sexually transmitted genital warts (condyloma acuminata) caused by human papilloma virus [17]. To describe a tumour with bulging growth with papillary excresences commonly squamous cell carcinoma [18].

Cheesy appearance: Gross appearance of the acellular material in caseous necrosis in granulomas produced by the release of lipid from cell walls of *Mycobacterium tuberculosis* and some systemic fungi [19].

Cherry red spot: A clinical sign seen at macula on fundus examination because of thickening and loss of transparency of posterior pole of retina in many inherited metabolic disorders, central retinal artery occlusion and orbital contusion and ischaemia [20].

Chicken fat appearance: The yellowish part of the postmortem clots formed from the RBC sediments and separate from plasma owing to the force of gravity [21].

Chicken wire pattern: Arrangement of capillaries in Myxoid liposarcoma [22], oligodendroglioma [23], low grade fibromyxoid sarcoma [24], clear cell sarcoma of the kidney [25], pericellular/ perisinusoidal fibrosis seen in alcoholic liver disease [26]. Calcification surrounding the chondroblasts seen in chondroblastoma [27].

Chocolate colored blood: The brown coloured blood in methemoglobinemia, a condition characterized by excess of haemoglobin with iron oxidized to ferric (Fe^{3+}) form [28].

Chocolate cyst: The appearance of the thick brown tar like fluid in the ovarian cyst with ectopic endometrial tissue [29].

Clover leaf cells: The bizarre, multilobulated nuclei with coarse chromatin and prominent nucleoli seen in the large atypical lymphocytes in Adult T-cell leukemia/ lymphoma [30].

Coffee bean nuclei: The nuclear morphology of the cells with enfolded nuclear membranes with distinct longitudinally grooved nuclei seen in Brenner tumour [31], granulosa cell tumour [32], Langerhans cell histiocytosis [33], papillary carcinoma of thyroid [34] and Walthard cell nests [35].

Cola coloured urine: The dark coloured urine caused by haemolysis

of red cells that have crossed the glomerular basement membrane and passed the tubules in children with acute glomerulonephritis [36].

Cone biopsy: Biopsy procedure done in cervical malignancies [37].

Cornflake artefact: Refractile brown artefact seen on superficial squamous cells due to air bubbles trapped under the coverslip [38].

Cottage cheese appearance: The white patches and plaques seen in pseudomembranous candidiasis of ginigiva and labial mucosa [39]. The thick, white odourless discharge seen in vulvovaginal candidiasis [40].

Crab like: Gross appearance of invasive ductal carcinoma with characteristic stellate appearance and interface with surrounding normal breast [41].

Curdy white discharge: The thick, white odourless discharge seen in vulvovaginal candidiasis [40].

Cut Cabbage appearance: The gross appearance of cut surface of giant fibroadenoma and phyllodes tumour with slit like spaces [42].

Cut Potato appearance: The pale, lobulated, bulging gross appearance of cut surface of Seminoma Testis [43].

Doughnut cells: The cells seen in anaplastic large-cell lymphoma with cytoplasmic pseudo-inclusions formed because of the invaginations of the nuclear membrane [44].

Doughnut granuloma: Small non necrotizing granulomas with central fat vacuoles surrounded by dense fibrin ring and epithelioid histiocytes, seen in liver in Q-fever and also in *Cytomegalovirus* hepatitis, allopurinol treatment, visceral leishmaniasis, infectious mononucleosis, Hodgkin's lymphoma and non-Hodgkin's lymphoma [45,46]. They are also called as fibrin ring granulomas [47].

Egg basket appearance: Overlapping and crowding of the nuclei in cells lining the tangentially sectioned neoplastic papillae in papillary carcinoma of thyroid [48]. Multilobulated Reed Sternberg cell in Hodgkin's lymphoma [49].

Fruity odour: The odour of acetone attempting to be excreted in lungs/breath seen in ketoacidosis seen in type 1 diabetes mellitus [50].

Fishy odour: The vaginal discharge of women with bacterial vaginosis due to trimethylamine [51].

Fish malodor syndrome: A metabolic disorder characterized by offensive smell of rotting fish due to excessive excretion of trimethylamine in urine, sweat, breath and other body secretions [52].

Fish net pattern: A pattern of binding of immunoglobulin G localized to the intercellular spaces in direct immunofluorescence in pemphigus vulgaris [53] described by Williams in 1989 [54].

Fishy odour: It is felt in poor hygiene, gingivitis, bacterial vaginosis, urinary tract infections [55], advanced renal and liver diseases [56].

Fish flesh appearance: The gross appearance of cut surface of smooth, slightly bulging pale tan, white grey colour seen in sarcomas [57], lymphomas [58], retinoblastoma [59], Wilm's tumour [60].

Flat cake: Appearance of normal placenta [61].

Fried egg appearance: Normal mast cells with central round nuclei and amphophilic cytoplasm that stains partially with haematoxylin and eosin stains [12]. Hairy cells with abundant cytoplasm than normal small lymphocytes seen in bone marrow biopsy in hairy cell leukemia [62]. Polychromatophilic and orthochromic normoblasts with centrally placed, intensely staining round nuclei and clearly discerned plasma membrane margins [63]. The neoplastic cells in lymphoplasmacytic lymphoma [64]. Long lived plasma cells with bubble like vacuoles or lipid droplets indicative of historical childhood infections [65]. The colonies of Mycoplasma pneumoniae grown in Eaton's agar [66]. The monomorphic cells of oligodendroglioma with uniform round vesicular nuclei, distinct small nucleoli and perinuclear halo [67]. The round tumour cells of seminoma testis with glycogen rich clear cytoplasm with sharp cell borders [68]. Long-lived plasma cells with bubble-like vacuoles or lipid droplets [69].

Grape like lesions: Enlarged thin walled villi in the form of translucent vesicles seen in molar pregnancy [70]. The gross appearance of sarcoma botyroides a subtype of embryonal rhabdomyosarcoma, that can be observed in the walls of hollow, mucosa lined structures in young children [71]. The abnormal plasma cells with cytoplasmic inclusions of immunoglobulin seen in multiple myeloma [72].

Herring bone pattern: Arrangement of tumour cells in short fascicles which split and merge giving the appearance of fish bone seen in fibrosarcoma [73].

Hemp seed: Small round or ovoid multiple grey or brown clumped appearance of calcium oxalate renal stones with varnished surfaces and a concentrically laminated structure [74].

Honey comb appearance:

- Changes in the lung caused by the obliteration of bronchioles by fibrosis or granulomata and compensatory dilatation of neighbouring bronchioles seen in bronchiectasis, cystic lung disease, end stage of lung with interstitial fibrosis [75–77].
- Gross appearance of the normal mucosa of gall bladder [78], hemangiomas [79–81], serous cystadenomas of pancreas [82], multiple subcutaneous nodules in actinomycosis [83].
- Cytological appearance of monolayered sheets of uniform columnar to cuboidal cells with evenly spaced nuclei seen in endocervical cells [84], thyroid follicular epithelial cells [85], normal bile ductal cells [86], pancreatic ductal cells [87].
- Foamy granular eosinophilic acellular intra-alveolar exudate of *Pneumocystis jiroveci* [88].

Hot potato voice: A defect of resonance in which the speech has a muffled quality, fancifully likened to a person speaking with a hot potato in the mouth, is the result of an underlying transient velopharyngeal insufficiency seen in peritonsillar abscess and peritonsillitis [89].

Lardaceous spleen: Deposition of amyloid in sinusoids and surrounding connective tissues of spleen [90].

Lemon on match stick appearance: Truncal obesity with relatively thin and lean limbs seen in Cushing's syndrome [91].

Maple syrup urine: Characteristic sweet aroma present in the body fluids seen in branched chain ketoaciduria (maple syrup urine disease), an autosomal recessive inherited disorder with deficiency of branched chain alpha keto acid dehydrogenase complex [92].

Millet seed appearance: Term coined in 1700 by John Jacob Manget to describe the tiny tubercles on gross examination of various organs in disseminated tuberculosis resulting from massive lymphohaematogenous spread [93].

Milky leg: The swollen white painful leg of phlegmasia alba dolens secondary to extensive deep vein thrombosis of the iliac and femoral veins [94].

Milky urine (Chyluria): Passage of white chylous material in the urine composed of albumin, emulsified fat and fibrin which are absorbed by intestinal lymphatics. Chyluria is seen in filariasis and other parasitic infestations [95], in nephrotic syndrome due to lipiduria [96], crystalluria due to precipitation of phosphate and urinary tract infection [97].

Meaty appearance: Gross appearance of cut surface of diffusely and symmetrically enlarged thyroid in diffuse toxic goiter [98,99].

Melon seeds: Agglutinated protein nodules nurtured by synovial fluid seen in tuberculous tenosynovitis [100].

Mulberry appearance: An early stage embryo (16 cell mass) consisting of blastomeres [101]. Round or ovoid, amber to dark brown appearance of calcium oxalate renal stones with numerous rounded bosses or mammillary processes [102].

Nutmeg liver: A perfusion abnormality of the liver in chronic venous hepatic congestion resulting in contrast between central congested sinusoidal space and the paler peripheries [103].

Oat cell carcinoma: The neoplastic cells with small oval hyperchromatic nucleus with scant cytoplasm resembling oats seen in small cell carcinoma of lung [104].

Omental cake: Thickening of the omentum secondary to tuberculosis [105] and in ovarian malignancies [106].

Onion Bulb appearance: A myelinated nerve fibre axon surrounded by one or more concentric layers of schwann cell processes and collagen due to repetitive segmental demyelination and regeneration of myelin seen in sural nerve in chronic inflammatory demyelinating polyneuropathy [107].

Onion skin appearance: A pattern characterized by concentric laminations of differing gross or histologic densities seen in

- Deposition of collagen around arteries of the spleen in syphilis [108].
- Concentric perivascular fibrosis of central and penicilliary arterioles of spleen in systemic lupus erythematosus [109] and thrombocytopenic purpura [110].
- Castleman disease with the appearance of lymphoid follicle surrounded by a broad mantle zone composed of concentric rings of small lymphocytes [111].
- Concentric laminated thickening of the walls of interlobular arterioles of the kidney due to proliferation of internal smooth muscle cells, the so called Hyperplastic arteriosclerosis seen in malignant hypertension [112].
- Concentric perivascular fibrosis highlighted by Masson trichrome stain in gastric inflammatory fibroid polyps [113], destructive bony lesion with lamellated type of periosteal bone formation seen in Ewing's sarcoma [114].
- The thickened vessels of the synovia due to myoid cell proliferation (microangiopathic lesions) seen in Lymes disease synovitis [115].

Onion skin fibrosis: Concentric periductal fibrosis involving interlobular bile duct seen in Primary Sclerosing Cholangitis [116].

Pancake brain: Represents the appearance of the cerebral parenchyma in case of a lobar holoprosencephaly [117].

Pea soup diarhoea: Foul smelling green yellow coloured stool in salmonella infection [118].

Pear shaped organ: Gross appearance of the normal uterus [119].

Portwine stain: A type of capillary vascular malformation [120].

Portwine coloured amniotic fluid: Amniotic fluid mixed with blood seen in abruptio placentae [121].

Popcorn cell: A type of Reed Sternberg cell seen specifically in nodular lymphocyte predominant Hodgkin's lymphoma with delicate, multilobulated folded nuclei, visible nucleoli and pale cytoplasm [122].

Potato nose: Hypertrophy of sebaceous glands of nasal tip in rhinophyma [123]. This appearance is also called as whisky nose, rum nose, wine nose, strawberry nose and brandy nose [124].

Red currant jelly sputum: Sputum tinged with mucus and blood seen in *Klebsiella pneumoniae* infection [125] and in bronchogenic carcinoma [126].

Raisin like nucleus: To describe an enlarged nuclei with coarse chromatin and wrinkled nuclear membrane of a koilocyte [127] or nuclei in poorly differentiated carcinoma [128].

Rice water stools: A watery diarrhoea containing flecks of whitish mucus and gastrointestinal lining epithelial cells which are about the size of pieces of rice seen in cholera infection [129].

Sago spleen: Deposition of amyloid in spleen limited to follicles [130] described first by Nicolaus Fontanus in 1639 [131].

Salmon patch: A type of capillary vascular malformation [132].

Shish Kebab appearance: Peculiar arrangement of the squamous cells around the long filamentous *Candida* in Pap smear [133].

Spaghetti and meat balls appearance: Tinea versicolor on KOH Preparation. Electron microscopic appearance of oligodendrocytes in Progressive Multifocal Leukoencephalopathy (PML).

Spaghetti tumour: Intravascular leiomyomatosis (endolymphatic stromal myosis), which grows extensively with in vessels [134].

Spaghetti noodles appearance: The winding cellular pattern of tumour cells with elongated nuclei randomly dispersed in a fibrous background seen in Plexiform neurofibroma [135].

Strawberry cervix: An erythematous cervix with pinpoint areas of exudation seen in *Trichomonas vaginalis* infection [136].

Strawberry Gall bladder: Macroscopic appearace of gall bladder with bright red mucosa with yellow mottling due to lipid seen in cholesterolosis of gall bladder [137].

Strawberry gums: Localised or generalized proliferative gingivitis with a mottled purplish red granular surface resembling an overripe strawberry seen in Wegener's granulomatosis [138], now called as granulomatosis with polyangitis [139].

Strawberry hemangioma, Strawberry nevus, Strawberry mark: Congenital cutaneous capillary hemangioma reminiscent of a ripe strawberry [140].

Strawberry skull: Shape of the skull in trisomy 18 [141].

Strawberry tongue: A form of glossitis with hyperplastic fungiform papillae seen in Kawasaki disease [142], scarlet fever [143] and toxic shock syndrome [144].

Sugar icing appearance: Thickening of the splenic capsule accompanied by hyalinization seen in hyalinising perisplenitis [145], thickened and whitish hepatic capsule seen in chronic perihepatitis and cardiac cirrhosis [146]. Whitish appearance of the serosal surface of the intestine seen in chronic fibrosing peritonitis [147].

Sugar tumour: Perivascular Epitheloid cell (PEComa) tumour of the lung with abundant cytoplasmic glycogen in the tumour cells [148].

Swiss cheese appearance: Overgrowth of the stroma and cystically dilated endometrial glands lined by flattened to low cuboidal to pseudostratified columnar epithelium found in endometrial hyperplasia [149]. The cribriform appearance of tumour cells resulting from numerous microcystic pseudoglandular spaces seen in adenoid cystic carcinoma [150].

Tender coconut appearance: White glistening membranes of excised hydatid cyst caused by *echinococcus granulosus* [151].

Pear shaped organism: Trophozoite of *trichomonas vaginalis* [152] and *giardia lamblia* [153].

Peau d'Orange appearance: The dimpled and swollen appearance of skin due to occlusion of lymphatics in carcinoma breast, [154] in filariasis [155], due to accumulation of excess glycosaminoglycans in the dermis and subcutis of the skin with prominent hair follicles in pretibial myxoedema in Grave's disease [156]. Diffuse mottling of the retinal pigment epithelium in an area temporal to the macula due to breaks in Bruch's membrane called angioid streaks in patients with pseudoxanthoma elasticum [157].

Pepper syndrome: The syndrome of massive hepatic metastases from Adrenal neuroblastoma described by Pepper in 1901 [158].

Portwine stain: A type of capillary vascular malformation.

Popcorn cells: The larger cells in nodular lymphocyte predominant Hodgkin's lymphoma with lobulated nuclei resembling the kernel of popped corn [159].

Raspberry tumour: An umbilical adenoma in the patent vitellointestinal duct. The mucosa prolapsing through the umbilicus gives raspberry like appearance [160].

Red currant jelly clots: The reddish part of the postmortem clots formed from the RBC sediments owing to the force of gravity [21].

Rice bodies: Described by Riese in 1895, seen in the joints and bursa of patients with tuberculosis and rheumatoid arthritis, formed mainly of fibrin [161,162].

Unripe pear: The gross appearance of yellowish chalky streaks due to extensive elastosis with a firm gritty texture seen in invasive carcinoma of the breast (scirrhous carcinoma) [163].

Watermelon stomach: The appearance of visible linear watermelon like vascular stripes in the antrum of stomach in gastric antral vascular ectasia [164], first described by Rider et al in 1953 [165] and the term coined by Jabbari M et al in 1984 [166].

Whartons jelly: A gelatinous substance present within the umbilical cord containing mucoid connective tissue and mesenchymal stem cells [167].

CONCLUSION

Usage of eponyms often makes a pathologist's laborious tasks more convenient. Analogical way of thinking helps us to learn and retain things in a better way.

REFERENCES

[1] Gibson ME. The identification of kala-azar and the discovery of Leishmania donovani. Med Hist. 1983;27(2):203.
[2] Rees PH. "Ague cake" or hyper-reactive malarial splenomegaly. East Afr Med J. 1994 Dec;71(12):761.
[3] Ignatavicius DD, Workman ML. Medical-Surgical Nursing: Patient-centered collaborative care. Elsevier Health Sciences; 2015. 1735p.
[4] Sayek I, Onat D. Pyogenic and amebic liver abscess. 2001 [cited 2016 Jan 27]; Available from: http://www.ncbi.nlm.nih.gov/books/NBK6955/
[5] Howie AJ, Brewer DB, Howell D, Jones AP. Physical basis of colors seen in Congo red-stained amyloid in polarized light. Lab Investig J Tech Methods Pathol. 2008 Mar;88(3):232–42.
[6] Heuer AJ, Scanlan CL. Wilkin's Clinical Assessment in Respiratory Care. Elsevier Health Sciences; 2013. 547p.
[7] Frankel A, Penrose C, Emer J. Cutaneous Tuberculosis. J Clin Aesthetic Dermatol. 2009 Oct;2(10):19–27.
[8] Dixon MWA, Dearnley MK, Hanssen E, Gilberger T, Tilley L. Shape-shifting gametocytes: how and why does P. falciparum go banana-shaped? Trends Parasitol. 2012 Nov;28(11):471–8.
[9] Wyszynski DF. Neural tube defects: from origin to treatment. Oxford University Press; 2005. 432p.
[10] Stehbens WE. Etiology of intracranial berry aneurysms. J Neurosurg. 1989 Jun 1;70(6):823–31.
[11] Mehta V, Balachandran C, Lonikar V. Blueberry muffin baby: a pictoral differential diagnosis. Dermatol Online J. 2008;14(2):8.
[12] Bolognia JL, Jorizzo JL, Rapini RP. Dermatology. Gulf Professional Publishing; 1438p.
[13] Hsiao Y-W, Tseng F-W, Shih Y-L, Kuo T, Jaing T-H, Hui RC-Y. Blueberry muffin baby with acute myeloid leukemia and spontaneous remission. Dermatol Sin. 2011 Jun;29(2):47–9.
[14] Smith HL, WIllius FA. Pericarditis: Iv. fibrinous pericarditis and "soldier's patches." Arch Intern Med. 1932 Sep 1;50(3):410–4.
[15] Shah KN. The diagnostic and clinical significance of café-au-lait macules. Pediatr Clin North Am. 2010 Oct;57(5):1131–53.
[16] Verma S, Tavaré CJ, Gilles FH. Histologic Features and Prognosis in Pediatric Medulloblastoma. Pediatr Dev Pathol. 2008 Sep;11(5):337–43.
[17] Sloane PD. Essentials of Family Medicine. Lippincott Williams & Wilkins; 2008. 838p.
[18] Nucci MR, Oliva E. Gynecologic Pathology. Elsevier Health Sciences; 2009. 725p.
[19] Goljan EF. Rapid Review Pathology: With STUDENT CONSULT Online Access. Elsevier Health Sciences; 2013. 787p.
[20] Suvarna J, Hajela S. Cherry-red spot. J Postgrad Med. 2008;54(1):54.
[21] Damjanov I. Pathology Secrets. Third Edition. United states of America: Elsevier Health Sciences; 2009. 523p.
[22] Fritchie KJ, Goldblum JR, Tubbs RR, Sun Y, Carver P, Billings SD, et al. The expanded histologic spectrum of myxoid liposarcoma with an emphasis on newly described patterns. Am J Clin Pathol. 2012 Feb 1;137(2):229–39.
[23] Cheng L. Essentials of Anatomic Pathology. Springer Science & Business Media; 2006. 1451p.
[24] Dawamneh MF, Amra NK, Amr SS. Low grade fibromyxoid sarcoma: report of a case with fine needle aspiration cytology and histologic correlation. Acta Cytol. 2006 Apr;50(2):208–12.
[25] Eble JN. Pathology and genetics of tumours of the urinary system and male genital organs. IARC;2004. 355pp.
[26] Theise ND. Histopathology of alcoholic liver disease. Clin Liver Dis. 2013 Apr 1;2(2):64–7.
[27] Bocklage TJ, Quinn R, Schmit B, Verschraegen C. Bone and soft tissue tumors: a multidisciplinary review with case presentations. JP Medical Ltd; 2014. 620p.
[28] do Nascimento TS, Pereira RO, de Mello HL, Costa J. Methemoglobinemia: from diagnosis to treatment. Rev Bras Anestesiol. 2008 Dec;58(6):651–64.
[29] Meigs JV. Endometrial hematomas of the ovary. Boston Med Surg J. 1922 Jul 6;187(1):1–13.
[30] Dahmoush L, Hijazi Y, Barnes E, Stetler-Stevenson M, Abati A. Adult T-cell leukemia/lymphoma: a cytopathologic, immunocytochemical, and flow cytometric study. Cancer. 2002 Apr 25;96(2):110–6.
[31] Borah T, Mahanta RK, Bora BD, Saikia S. Brenner tumor of ovary: An incidental finding. J -Life Health. 2011;2(1):40–1.
[32] Vodovnik A. Bladder-washing cytology of metastatic ovarian granulosa cell tumor. Diagn Cytopathol. 2002 Jun;26(6):387–8.
[33] Yap WM, Chuah KL, Tan PH. Langerhans cell histiocytosis involving the thyroid and parathyroid glands. Morden Pathalogy. 2001 Feb;14(2):111–5.
[34] Oertli D, Udelsman R. Surgery of the thyroid and parathyroid Glands. Springer Science & Business Media; 2012. 620p.
[35] Underwood JCE. Pathology of the Nucleus. Springer Science & Business Media; 2012. 450p.
[36] Welch TR. An Approach to the Child with Acute Glomerulonephritis. Int J Pediatr 2011 Nov 24;2012.
[37] Spitzer M, Chernys AE, Shifrin A, Ryskin M. Indications for cone biopsy: pathologic correlation. Am J Obstet Gynecol. 1998 Jan 1;178(1):74–9.
[38] Fang F, Ivan D. Cytopathology Review. Jaypee Brothers Publishers; 2014. 172p.
[39] Bruch JM, Treister NS. Clinical Oral Medicine and Pathology. Springer Science & Business Media; 2009. 176p.
[40] Kauffman CA, Pappas PG, Sobel JD, Dismukes WE. Essentials of Clinical Mycology. Springer Science & Business Media; 2011. 542p.
[41] Hindle WH. Breast Care: A Clinical Guidebook for Women's Primary Health Care Providers. Springer Science & Business Media; 2012. 487p.
[42] Shariff S. Fundamentals of Surgical Pathology. Jaypee Brothers Publishers; 2011. 413p.
[43] Ellis H, Watson C. Surgery, eTextbook: Clinical Cases Uncovered. John Wiley & Sons; 2010. 309p.
[44] Jaffe ES. Anaplastic large cell lymphoma: the shifting sands of diagnostic hematopathology. 2001 Mar 1;14(3):219–28.
[45] Silver SS, McLeish WA. "Doughnut" granulomas in Q fever. Can Med Assoc J. 1984 Jan 15;130(2):102–4.
[46] de Bayser L, Roblot P, Ramassamy A, Silvain C, Levillain P, Becq-Giraudon B. Hepatic fibrin-ring granulomas in giant cell arteritis. Gastroenterology. 1993 Jul;105(1):272–3.
[47] Galache C, Santos-Juanes J, Blanco S, Rodríguez E, Martínez A, Soto J. Q fever: a new cause of "doughnut" granulomatous lobular panniculitis. Br J Dermatol. 2004 Sep;151(3):685–7.
[48] Nikiforov YE, Biddinger PW, Thompson LDR. Diagnostic Pathology and Molecular Genetics of the Thyroid: A Comprehensive Guide for Practicing Thyroid Pathology. Lippincott Williams & Wilkins; 2012. 451p.
[49] Rosai J. Rosai and Ackerman's Surgical Pathology. Elsevier Health Sciences; 2011. 14838p.
[50] Zacharin M. Practical Pediatric Endocrinology in a Limited Resource Setting. Academic Press; 2013. 415p.
[51] Brand JM, Galask RP. Trimethylamine: the substance mainly responsible for the fishy odor often associated with bacterial vaginosis. Obstet Gynecol. 1986 Nov;68(5):682–5.
[52] Mitchell SC, Smith RL. Trimethylaminuria: the fish malodor syndrome. Drug Metab Dispos. 2001 Apr;29(4):517–21.
[53] Anuradha C, Malathi N, Anandan S, Magesh K. Current concepts of immunofluorescence in oral mucocutaneous diseases. J Oral Maxillofac Pathol JOMFP. 2011;15(3):261–6.
[54] Williams DM. Vesiculobullous mucocutaneous disease: pemphigus vulgaris. J Oral Pathol Med Off Publ Int Assoc Oral Pathol Am Acad Oral Pathol. 1989 Dec;18(10):544–53.
[55] Li M, Al-Sarraf A, Sinclair G, Frohlich J. Fish odour syndrome. CMAJ Can Med Assoc J. 2011 May 17;183(8):929–31.
[56] Rehman HU. Fish odor syndrome. Postgrad Med J. 1999 Aug;75(886):451–2.
[57] Heller DS. OB-GYN Pathology for the Clinician: A Practical Review with Clinical Correlations. Springer; 2015. 267p.
[58] DeLellis RA. Pathology and Genetics of Tumours of Endocrine Organs. IARC; 2004. 324p.
[59] Shields JA, Shields CL. Intraocular Tumors: An Atlas and Textbook. Lippincott Williams & Wilkins; 2008. 598p.
[60] Dhungel S, Cheng LJ, Hai ZZ. Elevated serum alpha-fetoprotein in Wilms' tumor: A case report with review of literature. J Pediatr Surg Case Rep. 2014 Mar;2(3):153–5.
[61] Power ML, Schulkin J. The Evolution of the Human Placenta. JHU Press; 2012. 278p.

[62] Rubin R, Strayer DS, Rubin E, (M.D.) JMM. Rubin's Pathology: clinicopathologic foundations of medicine. Lippincott Williams & Wilkins; 2008. 1368p.
[63] Keohane E, Smith L, Walenga J. Rodak's Hematology: Clinical Principles and Applications. Elsevier Health Sciences; 2015. 917p.
[64] Yang GCH, Tao L-C. Transabdominal Fine-Needle Aspiration Biopsy: A Colour Atlas and Monograph (with CD-ROM). World Scientific; 2007. 486p.
[65] Halliley JL, Tipton CM, Liesveld J, Rosenberg AF, Darce J, Gregoretti IV, et al. Long-lived plasma cells are contained within the CD19(-)CD38(hi)CD138(+) subset in human bone marrow. Immunity. 2015 Jul 21;43(1):132–45.
[66] Razin S. Mycoplasmas. In: Baron S, editor. Medical Microbiology [Internet]. 4th ed. Galveston (TX): University of Texas Medical Branch at Galveston; 1996 [cited 2016 May 31]. Available from: http://www.ncbi.nlm.nih.gov/books/NBK7637/
[67] Chhieng DC, Siegal GP. Updates in Diagnostic Pathology. Springer Science & Business Media; 2007. 213p.
[68] Hirsch MS. Genitourinary Pathology, An Issue of Surgical Pathology Clinics,. Elsevier Health Sciences; 2016. 265p.
[69] LeBien TW, Tedder TF. B lymphocytes: how they develop and function. Blood. 2008;112(5):1570–1580.
[70] Daftary. 100+ Clinical Cases In Obstetrics. Elsevier India; 2006. 478p.
[71] Mousavi A, Akhavan S. Sarcoma botryoides (embryonal rhabdomyosarcoma) of the uterine cervix in sisters. J Gynecol Oncol. 2010 Dec 30;21(4):273–5.
[72] Jaffe ES. Pathology and Genetics of Tumours of Haematopoietic and Lymphoid Tissues. IARC; 2001. 358p.
[73] Fletcher CDM. Diagnostic Histopathology of Tumors: Elsevier Health Sciences; 2007. 1931p.
[74] Pyrah LN. Renal Calculus. Springer Science & Business Media; 2012. 604p.
[75] Heppleston AG. The pathology of honeycomb lung. Thorax. 1956;11(2):77–93.
[76] Ryu JH, Swensen SJ. Cystic and cavitary lung diseases: focal and diffuse. Mayo Clin Proc. 2003 Jun;78(6):744–52.
[77] Arakawa H, Honma K. Honeycomb lung: history and current concepts. AJR Am J Roentgenol. 2011 Apr;196(4):773–82.
[78] Odze RD, Goldblum JR. Surgical Pathology of the GI Tract, Liver, Biliary Tract, and Pancreas. Elsevier Health Sciences; 2009. 1387p.
[79] Kaya B, Işlgan SE, Çerkez C, Otrakçı V, Serel S. Intraosseous cavernous hemangioma: a rare presentation in maxilla. Eplasty [Internet]. 2014 Sep 23 [cited 2016 May 26];14. Available from: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4194598/
[80] Sethi S, Agarwal V, Chopra P. Cavernous hemangioma of the kidney: A report of two cases and review of the literature. Urol Ann. 2012;4(3):187–90.
[81] Ziari K, Alizadeh K. Ovarian hemangioma: a rare case report and review of the literature. Iran J Pathol. 2016;11(1):61–5.
[82] Iacobuzio-Donahue CA, Montgomery EA. Gastrointestinal and Liver Pathology: A Volume in the Series: Foundations in Diagnostic Pathology. Elsevier Health Sciences; 2011. 3010p.
[83] Miller NR, Walsh FB, Hoyt WF. Walsh and Hoyt's Clinical Neuro-ophthalmology. Lippincott Williams & Wilkins; 2005. 1176p.
[84] Kocjan G, Gray W, Vielh P, Levine T, Kardum-Skelin I. Diagnostic Cytopathology Essentials. Elsevier Health Sciences; 2013. 476p.
[85] Nguyen G-K, Lee MW, Ginsberg J, Wragg T, Bilodeau D. Fine-needle aspiration of the thyroid: an overview. CytoJournal. 2005 Jun 29;2:12.
[86] Conrad R, Castelino-Prabhu S, Cobb C, Raza A. Cytopathologic diagnosis of liver mass lesions. J Gastrointest Oncol. 2013;4(1):53.
[87] Field AS, Zarka MA. Practical Cytopathology: A Diagnostic Approach: A Volume in the Pattern Recognition Series. Elsevier Health Sciences; 2012. 563p.
[88] Husain AN. Thoracic Pathology. Elsevier Health Sciences; 2012. 632p.
[89] Finkelstein Y, Bar-Ziv J, Nachmani A, Berger G, Ophir D. Peritonsillar abscess as a cause of transient velopharyngeal insufficiency. Cleft Palate-Craniofacial J Off Publ Am Cleft Palate-Craniofacial Assoc. 1993 Jul;30(4):421–8.
[90] Petroianu A. The Spleen. Bentham Science Publishers; 2011. 286p.
[91] Lumley JSP, D'Cruz AK, Hoballah JJ, Scott-Connor CEH. Hamilton Bailey's Physical Signs: Demonstrations of Physical Signs in Clinical Surgery, 19th Edition. CRC Press; 2016. 678p.
[92] Podebrad F, Heil M, Reichert S, Mosandl A, Sewell AC, Böhles H. 4,5-dimethyl-3-hydroxy-2[5H]-furanone (sotolone)--the odour of maple syrup urine disease. J Inherit Metab Dis. 1999 Apr;22(2):107–14.
[93] Sharma SK, Mohan A, Sharma A. Challenges in the diagnosis & treatment of miliary tuberculosis. Indian J Med Res. 2012 May;135(5):703–30.
[94] Brown DE, Neumann RD. Orthopedic Secrets. Elsevier Health Sciences; 2004. 482p.
[95] Sachit S, AshokKumar H, et al., Chyluria-an overview. Nephro-Urol Mon. 2009;1(1, Summer):14–26.
[96] Graziani G, Cucchiari D, Verdesca S, Balzarini L, Montanelli A, Ponticelli C. Chyluria associated with nephrotic-range proteinuria: pathophysiology, clinical picture and therapeutic options. Nephron Clin Pract. 2011;119(3):c248–54.
[97] Sunder S, Jayaraman R, Mahapatra HS, Sathi S, Venkataramanan K, Prabhu K, et al. Analysis of case series of milky urine: A single center and departmental clinical experience with emphasis on management perspectives: A prospective observational study. Urol Ann. 2014;6(4):340–5.
[98] Weidner N, Cote RJ, Suster S, Weiss LM. Modern Surgical Pathology. Elsevier Health Sciences; 2009. 1294p.
[99] Holliman J, Feeback DL, Hall NK. Pathology. Springer Science & Business Media; 2012. 240p.
[100] Hibbs R, de Forest A. TUBERCULOSIS OF BONES & JOINTS. [cited 2016 May 26]; Available from: http://lrsitbrd.nic.in/IJTB/Year%201993/July%201993/jul1993%20B.pdf
[101] Greenfield S. The Human Brain: A Guided Tour. Hachette UK; 2014. 128p.
[102] Walls J. Urinary Tract Infections, Calculi and Tubular Disorders. Springer Science & Business Media; 2012. 105p.
[103] Rolleston SHD, Kanthack AA. Manual of Practical Morbid Anatomy: Being a Handbook for the Post-mortem Room. CUP Archive; 1894. 268p.
[104] Travis WD. Update on small cell carcinoma and its differentiation from squamous cell carcinoma and other non-small cell carcinomas. Mod Pathol. 2012 Jan;25(S1):S18–30.
[105] Ejaz K, Raza S, Kashif W. Omental caking: a rare but grave sign in prognosis of carcinoma endometrium. J Surg Pak. 2008;13:175–7.
[106] Rhodes AI, Joarder R, Al-Kutoubi A. Omental cake–cause? Postgrad Med J. 1998;74(871):267.
[107] Taly A, Nalini A, Shankar S, Mahadevan A, Kulkarni G. Sural nerve biopsy in chronic inflammatory demyelinating polyneuropathy: Are supportive pathologic criteria useful in diagnosis? Neurol India. 2010;58(4):542.
[108] Wilson CB, Nizet V, Remington JS, Klein JO, Maldonado Y. Infectious Diseases of the Fetus and Newborn. Elsevier Health Sciences; 2010. 1275p.
[109] Gattuso P, Reddy VB, David O, Spitz DJ, Haber MH. Differential Diagnosis in Surgical Pathology. Elsevier Health Sciences; 2009. 1126p.
[110] Saracco SM, Farhi DC. Splenic pathology in thrombotic thrombocytopenic purpura. Am J Surg Pathol. 1990 Mar;14(3):223–9.
[111] Ioachim HL, Medeiros LJ. Ioachim's Lymph Node Pathology. Lippincott Williams & Wilkins; 2009. 702p.
[112] Davison AM. Oxford Textbook of Clinical Nephrology Volume 2. Oxford University Press; 2005. 1132p.
[113] Owens SR, Appelman HD. Atlas of Esophagus and Stomach Pathology. Springer Science & Business Media; 2013. 191p.
[114] Vigorita VJ. Orthopaedic Pathology. Lippincott Williams & Wilkins; 2008. 816p.
[115] Miettinen M. Modern Soft Tissue Pathology: Tumors and Non-Neoplastic Conditions. Cambridge University Press; 2010. 1117p.
[116] Steele IL, Levy C, Lindor KD. Primary sclerosing cholangitis–approach to diagnosis. Medscape Gen Med. 2007 Apr 25;9(2):20.
[117] Gilbert-Barness E, Spicer DE, Steffensen TS. Handbook of Pediatric Autopsy Pathology. Springer Science & Business Media; 2013. 768p.
[118] Goroll AH, Jr AGM. Primary Care Medicine: Office Evaluation and Management of The Adult Patient: Sixth Edition. Lippincott Williams & Wilkins; 2011. 3793p.
[119] Chiras DD. Human Body Systems: Structure, Function and Environment. Jones & Bartlett Learning; 2003. 164p.
[120] Berg JN, Quaba AA, Georgantopoulou A, Porteous MEM. A family with hereditary port wine stain. J Med Genet. 2000 Aug 1;37(8):e12–e12.
[121] Kennedy BB, Ruth DJ, Martin EJ. Intrapartum Management Modules: A Perinatal Education Program. Lippincott Williams & Wilkins; 2009. 666p.
[122] Koss LG, Melamed MR. Koss' Diagnostic Cytology and Its Histopathologic Bases. Lippincott Williams & Wilkins; 2006. 906p.
[123] George. Sss-Otorhinolaryngology And Head & Neck Surgery. Elsevier India; 284p.
[124] Denecke HJ, Meyer R. Plastic Surgery of Head and Neck: Volume I: Corrective and Reconstructive Rhinoplasty. Springer Science & Business Media; 2012. 835p.
[125] Helms RA, Quan DJ. Textbook of Therapeutics: Drug and Disease Management. Lippincott Williams & Wilkins; 2006. 2773p.
[126] Das KK. Clinical Medicine. JP Medical Ltd; 2013. 828p.
[127] Pathology ASFC& C, Ferris DG. Modern Colposcopy: Textbook and Atlas. Kendall Hunt; 2004. 726p.
[128] Schirmer EC, Heras JI de las. Cancer Biology and the Nuclear Envelope: Recent Advances May Elucidate Past Paradoxes. Springer Science & Business Media; 2014. 610p.
[129] Nelson EJ, Chowdhury A, Harris JB, Begum YA, Chowdhury F, Khan AI, et al. Complexity of rice-water stool from patients with *Vibrio cholerae* plays a role in the transmission of infectious diarrhea. Proc Natl Acad Sci U S A. 2007 Nov 27;104(48):19091–6.
[130] Herold G. HEROLD's Internal Medicine (Second Edition) - Vol. 1. Lulu.com; 2014. 458p.
[131] Kyle RA. Amyloidosis: a convoluted story. Br J Haematol. 2001 Sep 1;114(3):529–38.
[132] Leung AKC, Barankin B, Hon KL, Persistent salmon patch on the forehead and glabellum in a Chinese adult, . 2014 May 14;e139174.
[133] Moriarty AT, Darragh TM, Fatheree LA, Souers R, Wilbur DC. Performance of Candida-Fungal-Induced atypia and proficiency testing: observations from the college of American Pathologists Proficiency Testing Program. Arch Pathol Lab Med. 2009;133(8):1272–1275.
[134] Lentz GM, Lobo RA, Gershenson DM, Katz VL. Comprehensive Gynecology. Elsevier Health Sciences; 2012. 957p.
[135] Eversole LR. Clinical Outline of Oral Pathology: Diagnosis and Treatment. PMPH-USA; 2011. 760p.
[136] Swygard H, Seña AC, Hobbs MM, Cohen MS. Trichomoniasis: clinical manifestations, diagnosis and management. Sex Transm Infect. 2004 Apr 1;80(2):91–5.
[137] Odze RD, Goldblum JR. Odze and Goldblum Surgical Pathology of the GI Tract, Liver, Biliary Tract and Pancreas. Elsevier Health Sciences; 2014. 1894p.
[138] Cardesa A, Slootweg PJ. Pathology of the Head and Neck. Springer Science & Business Media; 2006. 334p.
[139] Falk RJ, Gross WL, Guillevin L, Hoffman G, Jayne DRW, Jennette JC, et al. Granulomatosis with polyangiitis (Wegener's): An alternative name for Wegener's granulomatosis. Ann Rheum Dis. 2011 Apr 1;70(4):704–704.

[140] Callahan AB, Yoon MK. Infantile hemangiomas: A review. Saudi J Ophthalmol. 2012 Jul;26(3):283–91.
[141] Nicolaides KH, Salvesen DR, Snijders RJ, Gosden CM. Strawberry-shaped skull in fetal trisomy 18. Fetal Diagn Ther. 1992;7(2):132–7.
[142] Pemberton MN, Doughty IM, Middlehurst RJ, Thornhill MH. Case study: Recurrent Kawasaki disease. Br Dent J. 1999 Mar 27;186(6):270–1.
[143] Sarkar R, Garg V, Mishra K. Fever with rash in a child in India. Indian J Dermatol Venereol Leprol. 2012;78(3):251.
[144] Lotti T, Parish LC, Rogers RSI. Oral Diseases: Textbook and Atlas. Springer Science & Business Media; 2012. 371p.
[145] Burton J, Saunders S, Hamilton S. Atlas of Adult Autopsy Pathology. CRC Press; 2015. 294p.
[146] Sherlock S, Dooley J. Diseases of the Liver and Biliary System. John Wiley & Sons; 2008. 725p.
[147] Segen JC. The Dictionary of Modern Medicine. CRC Press; 1992. 832p.
[148] Sen S, Senturk E, Kuman NK, Pabuscu E, Kacar F. PEComa (clear cell "sugar" tumor) of the lung: a benign tumor that presented with thrombocytosis. Ann Thorac Surg. 2009 Dec;88(6):2013–5.
[149] Buja LM, Krueger GRF. Netter's Illustrated Human Pathology Updated Edition. Elsevier Health Sciences; 2013. 555p.
[150] Pilch BZ. Head and Neck Surgical Pathology. Lippincott Williams & Wilkins; 2001. 718p.
[151] Babitha F, Priya P, Poothiode U. Hydatid cyst of bone. Indian J Med Microbiol. 2015;33(3):442.
[152] Meyer EA. Other Intestinal Protozoa and Trichomonas Vaginalis. In: Baron S, editor. Medical Microbiology [Internet]. 4th ed. Galveston (TX): University of Texas Medical Branch at Galveston; 1996 [cited 2016 May 30]. Available from: http://www.ncbi.nlm.nih.gov/books/NBK7889/
[153] Vasan, R.S. Textbook of Medicine. Orient Blackswan; 1998. 1408p.
[154] Zaslau S. Shelf-Life Surgery. Lippincott Williams & Wilkins; 2014. 514p.
[155] Nutman TB. Lymphatic Filariasis. World Scientific; 2000. 293p.
[156] Provost TT, (MD.) JAF. Cutaneous Medicine: Cutaneous Manifestations of Systemic Disease. PMPH-USA; 2001. 808p.
[157] Spaide RF. Peau d'orange and angioid streaks: manifestations of Bruch membrane pathology. Retina Phila Pa. 2015 Mar;35(3):392–7.
[158] Gupta BD. Ocular metastases in hutchison-peppers' syndrome. Indian J Ophthalmol. 1957 Jul 1;5(3):55.
[159] Smith LB. Nodular lymphocyte predominant Hodgkin lymphoma: diagnostic pearls and pitfalls. Arch Pathol Lab Med. 2010;134(10):1434–1439.
[160] Moore T, Johnston AOB. Complications of Meckel's diverticulum. Br J Surg. 1976 Jun 1;63(6):453–4.
[161] Popert J. Rice-bodies, synovial debris, and joint lavage. Rheumatology. 1985;24(1):1–2.
[162] Jeevannavar SS, Baindoor P. "Rice bodies in the knee": classic tuberculosis of the knee. BMJ Case Rep. 2014 Apr 17;2014:bcr2013202975.
[163] Gould I. MRSA In Practice. CRC Press; 2006. 607p.
[164] Gretz JE, Achem SR. The watermelon stomach: clinical presentation, diagnosis, and treatment. Am J Gastroenterol. 1998 Jun;93(6):890–5.
[165] Rider JA, Klotz AP, Kirsner JB. Gastritis with veno-capillary ectasia as a source of massive gastric hemorrhage. Gastroenterology. 1953 May;24(1):118–23.
[166] Jabbari M, Cherry R, Lough JO, Daly DS, Kinnear DG, Goresky CA. Gastric antral vascular ectasia: the watermelon stomach. Gastroenterology. 1984 Nov;87(5):1165–70.
[167] Wang HS, Hung SC, Peng ST, Huang CC, Wei HM, Guo YJ, et al. Mesenchymal stem cells in the Wharton's jelly of the human umbilical cord. Stem Cells Dayt Ohio. 2004;22(7):1330–7.

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