PATTERN OF BREAST DISEASES IN ACCRA: REVIEW OF MAMMOGRAPHY REPORTS

E.K. BRAKOHIAPA[1], G.E. ARMAH[2], J.N.A CLEGG-LAMPTEY[3] and W.O. BRAKOHIAPA[4]

[1]Department of Radiology, University of Ghana of Medical School, College of Health Sciences, Korle-Bu, Accra, Ghana [2] Noguchi Memorial Institute for Medical Research, College of Health Sciences, University of Ghana, Legon, Accra, Ghana [3]Department of Surgery, University of Ghana of Medical School, College of Health Sciences, Korle-Bu, Accra, Ghana and [4] Radiology Faculty Chairman, Ghana College of Physicians and Surgeons, Accra, Ghana.

Corresponding Author: Dr. E. K. Brakohiapa   *E-mail:* ebrakohiapa2000@yahoo.com

Conflict of Interest: None declared.

SUMMARY

Objectives: To document the mammographic patterns in females seeking medical attention in Accra.

Design: An analytic retrospective study was conducted using data extracted from mammography request forms and corresponding radiological reports of 180 females.

Setting: The radiology departments of Korle-Bu Teaching Hospital, the Trust Hospital and Medical Imaging Ghana, all located in Accra.

Results: One hundred and eighty radiologic request forms for mammographic evaluations and their corresponding reports from the study period were reviewed. The mean age of the study population was 48.7 years (SD=10.0), and the median age group was the 41–50 group. There were more screening mammography evaluations (115 examinations) than diagnostic mammography evaluations (65 examinations). Most of the cases diagnosed as breast cancer were in the age group 41–50 years. Benign lesions were commoner than cancer (55 and 16 cases respectively). The commonest presenting complaint was of pain.

Conclusion: The larger number of screening mammographic evaluations conducted for asymptomatic females during the study period, as compared to diagnostic mammographic evaluations for symptomatic females, suggests that educational programs on early breast cancer detection are having a positive impact on the target population. The observation that 22.8% of lesions had features suggestive of breast cancer in the study is significantly high to also warrant intensification of the existing awareness programs. As non-specific masses were the most common radiographically observed lesions, hospitals equipped with sonography and biopsy facilities that compliment their mammography are better suited for thorough breast disease evaluation.

Keywords: Mammography, sonography, screening study, diagnostic study, ductal carcinoma in situ, invasive ductal carcinoma.

INTRODUCTION

Breast disease is often initially associated with anticipation of having breast Cancer.[1] This is usually distressing for the patient, the patient's family and friends. It is therefore imperative that society attaches great importance to any method which helps in the early evaluation of breast disease with the aim of excluding breast cancer. Most specialized breast cancer detection centres in Ghana are located in larger cities such as Accra and Kumasi.[2] The high costs of hospital admission, surgery, laboratory and radiologic examinations, coupled with the high cost of transportation to the centre for those living outside the big cities are usually beyond the reach of many rural folk resulting in late disease presentation.[3]

This is often associated with ulceration of the skin overlying the breast cancer, accompanied usually by a foul stench which causes affected females to shy away from others, further alienating themselves. The breast is a rudimentary organ on the anterior thoracic wall in males and prepubertal females. In the adult or adolescent females however, it lies in the superficial fascia and consists of glandular tissue and a varying amount of fat divided into about 15 to 20 lobes, radially disposed around the nipple by fascial septae, which also attach the gland to the skin and the underlying deep fascia over the pectoralis muscles. The base of the breast usually extends from the second to the sixth ribs, and from the side of the sternum to the midaxillary line.

Each breast lobe is further divided into terminal duct lobular units (TDLU), comprising numerous extralobular terminal ducts (which join to form the main lactiferous duct) and lobules made up of intralobular terminal ducts, acini, and intralobular connective tissue. Each lobe has a 2.0 to 4.5mm main lactiferous duct which converges on the nipple with an opening in the central portion of the latter.[4]

Breast disease is a fairly common predicament of many females resulting in a large number of women reporting to hospitals within the Greater Accra Region for management. The top 10 causes of cancer mortality in descending order in Ghanaian females recorded in a ten year study from 1991 to 2000, were breast, haematopoietic organs, liver, cervix, ovary, pancreas, stomach, colorectal, gall bladder and brain.[5] The prevalence appears to be increasing at the Korle-Bu Teaching Hospital (KBTH), rising from 12.8% in 1996 to 15.4 % in 2007.[6] The incidence of breast cancer is variable worldwide, ranging from 19 / 100,000 in China and Zimbabwe to 101.1 / 100,000 females in United States of America.[7] It has also been reported that breast cancer incidence peaks between 35 and 45years in West African women, 10-15 years earlier than for western countries.[8]

Breast lesions referred for mammographic evaluation generally fall into two broad groups, benign conditions and malignant conditions. Benign lesions form the vast majority. In the case of benign conditions, the most common symptom or complaint is pain. Benign breast disease includes breast cysts[1,9], noncyclical or cyclical ductal enlargement from menstruation, and inflammatory conditions such as breast abscesses and mastitis[10]. Since breast pain is a common complaint and often associated with benign lesions, imaging is useful for reassuring the patient of a greater likelihood of having a benign condition, and excluding cancer.[1,9]

Breast disease is commonly evaluated using mammography, sonography or both. Mammography utilizes low dose energy x-rays with a small focal spot to provide high quality images capable of demonstrating microcalcifications (which are commonly associated with intraductal malignancy), and non-palpable lesions.[11] Mammography can also be used to evaluate the marginal characteristics of breast masses. Benign lesions exhibit well-defined borders, whilst irregularity and poor marginal definition are common features often associated with malignancy.

Sonography utilizes sound energy with frequencies above the human audible range (20Hz – 20,000Hz) to create images of tissues in the region of interest. This method is superior to mammography in demonstrating the marginal characteristics of lesions, and unlike the latter, can also distinguish between solid and cystic lesions. Sonography is useful in evaluating dense breast tissue often found in younger females, and in viewing breast lesions not visible on mammograms. Sonography is not useful for detecting microcalcifications.

Combining mammography with sonography has proved to be very useful in the identification of both benign and malignant palpable breast masses.[12]

Other less commonly used modalities are ductography and magnetic resonance imaging (MRI). Ductography involves injecting iodinated contrast medium into a lactiferous duct to evaluate any possible cause of an abnormal nipple discharge, or ductal dilatation seen during mammography or sonography. MRI utilizes the magnetic properties of cells in the human body to create images of the organs in which they occur. It is expensive and not readily available in our environment. It is therefore not commonly requested by medical practioners for breast evaluation. It is used to evaluate breast implants for leaks or ruptures, to assess abnormal areas seen on mammograms, or felt after breast surgery or radiotherapy.[13] MRI, like sonography, is also useful in evaluating dense breast tissue and in viewing breast lesions not visible on mammograms. Although ductography and MRI are available at the Radiology Department of KBTH, mammogram and sonography are the commonly used modalities.

METHODS
A retrospective study was conducted using data extracted from mammography request forms and corresponding radiological reports of 180 females who were examined mammographically in KBTH, the Trust Hospital and Medical Imaging Ghana, all in the Greater Accra Region, in the year 2004. The mammographic images included in the study were reviewed by 2 qualified radiologists, 1 with 2 years' post-qualification experience, and the other with over 30 year's post-qualification experience. The aim of the study was to review retrospectively the mammographic patterns in females seeking medical attention in the Greater Accra region of Ghana in 2004, to generate age specific radiologic data on the frequency of breast lesions, as well as the age distribution of females seeking radiologic evaluation in Accra.

Only properly and adequately completed mammography request forms were included in the study. Information extracted included patient age, sex, hospital of referral, and clinical history. Also extracted for each patient were the significant findings and the radiologic diagnosis from the corresponding report sheet. All data were coded and entered into a database using the Microsoft Access data base. Data analysis was then carried out using the STATA analysis program.

The KBTH is affiliated with the medical school of the University of Ghana. The hospital has 1600 beds and various departments including surgical (general and

specialized), medical, physiotherapy, nutrition, obstetrics and gynaecology, paediatric, radiology, radiotherapy, haematology, dental and emergency. Laboratory services are also available.

RESULTS

A total of 180 radiologic request forms for mammographic evaluations and their corresponding reports from the study period were reviewed. There were no requests or reports involving male patients. The largest numbers of evaluations, 50 diagnostic mammography evaluations, and 106 screening mammography evaluations, were conducted for patients who had visited the Trust Hospital. The Korle-Bu Teaching Hospital had conducted the second highest number of mammographic evaluations with 9 diagnostic and 6 screening cases. The remaining patients had their mammographic evaluations conducted at Medical Imaging Ghana, and consisted of 6 diagnostic and 3 screening evaluations respectively.

The age distribution of mammographically diagnosed lesions amongst the various age groups is shown in Table 1. The median age group for the study as shown in Table 1 is the 41 – 50 group. The mean age was 48.7 (SD = 10.0). The greatest number of malignant lesions, 6 (8.5% of all diagnosed lesions) occurred in the 41-50year group, followed by 4 lesions (5.6%) in the over 70 years group. Three lesions each were seen in the 51-60 and 61-70 year groups, whilst no malignant lesion was recorded in the 21-40 year group. The 41-50 year group also had the greatest number of benign lesions, 33(forming 46.5% of all diagnosed lesions).

Table 1 Type of Breast Lesions by Age Distribution

AGE	Number of lesions	Malignant(%)	Benign (%)
21-40 years	5	0	5 (7.0)
41-50 years	39	6 (8.5)	33 (46.5)
51-60 years	15	3 (4.2)	12 (16.9)
61-70 years	5	3 (4.2)	2 (2.8)
>70 years	7	4 (5.6)	3(4.2)
Total	71	16(22.5)	55(77.4)

Of the 65 patients presenting for diagnostic mammographic evaluation, 36 (55.4%) were between 41 to 50 years of age, whilst 58 (50.4%) of 115 patients presenting for screening mammographic evaluation fell within the same age group. The 51- 60 year group had the second highest number of patients, 14 (21.5%) for diagnostic studies and 30 (26.1%) for screening studies. Non-specific lesions / masses, was the most common breast disorder presented, with 21 (29.5 %)

out of 71 lesions. For the purpose of our study, non-specific masses were defined as those that showed no obvious signs of malignancy and were thus likely benign (BIRADS 3). Lymph nodes, invasive ductal carcinoma, benign cysts, fibroadenomas and ductal carcinoma insitu in descending order of frequency, were the next commonly diagnosed lesions presenting with 17, 13, 9, 6 and 3 lesions respectively.
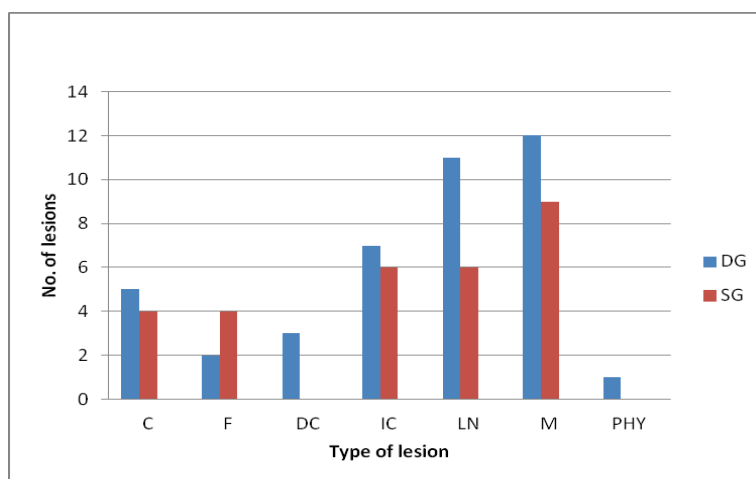

Figure 1 Frequency of Radiological Lesions versus Type of Examination
Legend: C- cysts, F- fibroadenoma, DC- dcutal carcinoma insitu, IC- invasive ductal carcinoma, LN- lymph nodes, M- non-specific masses, PHY- phylloides tumour, DG- diagnostic evaluation, SG- screening evaluation.

The least common lesion was a single case of a phylloides tumour (1.4%). Figure 1 divides the diagnosed lesions into those seen in patients who had screening studies and those who had diagnostic studies. It exhibits similar trends of patient presentation for both screening and diagnostic studies.

Only 21 request forms had a specific record of the patient's signs and symptoms. 11 patients complained of breast pain, 7 of breast swelling, and 3 of nipple discharge and or a skin rash. The remaining requests for diagnostic mammographic evaluation had 'Query breast cancer' stated in their brief clinical history columns.

Available pathology reports for only 5 cases in whom excision biopsy was recommended were also obtained and documented. Four of these 5 were reported as being suspicious for carcinoma.

DISCUSSION

The mean age for the study as shown in Table 1 is 48.7 (SD=10.0). The 41–50 year age group had the highest number of patients for both the diagnostic and screening studies, with 36 cases (20.0%) and 58 cases (32.2%) respectively. Overall, this age group form 52.2% of all the cases reviewed.

This is also the age group for which early cancer screening is recommended[13,14], as studies have shown that the onset of breast cancer in West African females occurs with a peak incidence between 35 to 45 years [8], about 10 to 15 years earlier than in Western Caucasian. This study however demonstrates a slight shift towards and above the upper limit of this age group.

These females also fall within the active workforce of most institutions and may be involved in institutional based screening programs which are usually conducted for females older than 40 years of age or those at risk. Public awareness on breast related health issues due to numerous health talks on television, radio and in the print media may also be responsible for the larger number of screening examinations conducted. The decreasing patient frequencies from the 51-60 year age group (24.4%) to the 61-70 year group (6.6%) and finally, the over 70 year age group (5.0%), may be in part due to demographics, bearing in mind that the life expectancy of Ghanaian females stands at 46 to 58years.[16,17]

The small number of females in the 21-40 year group (11.2%) could be explained by the reluctance of radiology staff to conduct mammographic studies on patients less than 35years old, except in cases with a high risk for carcinoma as is the case in patients with a family history of breast cancer in a first degree relative (especially if the cancer was diagnosed before the age of 45 years). Most 70 year olds are also retired and are likely settled in rural communities without facilities for breast imaging.[2] The high cost of travelling to the urban breast screening centres, coupled with the lack of adequate education on the need for early breast cancer detection are also likely to discourage these older females from seeking radiographic evaluation.[3]

Of the 180 cases reviewed, 156 (86.7%) had been evaluated at the Trust Hospital. One hundred and six (67.9%) of the 156 were involved in breast screening exercises organized by institutions. A small number of patients, 15 (8.3%), were attended to at the KBTH due to a breakdown of the mammographic equipment for most of the study period. Out of the total study group of 180 cases, 115 (63.9 %) and 65(36.1%) constituted screening and diagnostic study examinations respectively. This suggests an increased awareness and a positive response to programs aimed at early detection of breast cancer. At the KBTH however, more patients presented for diagnostic evaluation (9 cases) than for screening evaluation (6 cases). These figures are however too few for an objective inference to be made regarding mammographic studies at KBTH.

Figure 1 shows that of the radiologically diagnosed lesions, non-specific breast masses were the commonest lesions encountered, followed by benign-looking lymph nodes, invasive ductal carcinoma (IC), simple breast cysts, fibroadenomas, ductal carcinoma insitu (DCIS), and phylloides tumour in descending order of frequency. This is consistent with two earlier studies conducted at the Pathology and Surgical Departments of the KBTH, which showed fibroadenoma and fibroadenosis to be the commonest lesions observed.[18,19] An audit of excised breast lumps in Ghanaian women is also supported by the above findings.[20]

A study by B. N. Baako conducted in the North and South of Ghana also supports these results, and has the highest number of patients presenting with fibroadenosis, followed by fibroadenomas, breast abscess and carcinoma in descending order.[21] Invasive ductal carcinoma was the most common radiologically diagnosed malignancy, with 13 out of 180 cases, forming 18.6% of lesions. Three cases (4.3%) had features suggestive of ductal carcinoma insitu (DCIS), bringing the total percentage of malignant and premalignant tumours detected in the study to 22.9%. This is quite similar to results obtained in a pathologic review of surgical material obtained from breast biopsies and mastectomies in KBTH conducted between 1977 and 1978, which revealed cancers to be 24.0% of all lesions.[18]

The study reveals that most individuals examined mammographically had normal results: 110 out 180 people studied, forming 61.1%. This finding is consistent with the study of B. N. Baako which obtained normal results in 61.1% of women examined.[21] Most cysts occurred between the ages of 41 and 60 years and formed 12.9% of all lesions detected. Fibroadenomas were found between the ages of 21 and 60 years and formed 8.6% of the total lesions detected.[22] Three lesions (4.3%) suspicious for ductal carcinoma insitu were detected in patients aged 41 and above, 2 of which occurred in the 41 to 50 years group. The remaining case occurred in the above 70 year age group.

Thirteen cases of invasive ductal carcinoma were recorded. Six of these were detected during routine screening studies, whilst 7 were observed during diagnostic studies.

The age group with the largest number of 4 invasive ductal carcinomas was the 41- 50 year group. The remaining 9 cases were evenly distributed among the 51–60, 61–70, and > 70 year groups. This suggests that generally cancer is also common in the older age groups which coincidentally have fewer patient numbers.

However, due to the small number of patients involved in the study, it is not possible to conclude that these findings show any significant deviation from earlier studies by Alero Fregene etal which suggested the onset of breast cancer in West African females occurs with a peak incidence between 35 to 45 years.[8] The high proportion of tumors detected in the older age groups may be in part due to the adoption of western lifestyles including childbirth at a much older age usually as a result continued education, fewer number of children per females, a preference for western foods and improved health care facilities leading to increased life expectancy figures.[16] Seventeen patients had lymph nodes.

Of these, 12 were seen in the 41-50 year age group, 3 in the 51-60 age group, and 2 in the above 70 year age group. Two patients in the 41-50 year age group each had a lymph node and another lesion, namely a non-specific mass and a DCIS. Two patients in the >70year age group each had a lymph node in association with a malignant lesion, namely DCIS and invasive ductal carcinoma. Lymphadenopathy may be unilateral, usually as a result of mastitis or cancer, or it may be bilateral. Causes of bilateral lymphadenopathy include systemic infection, collagen vascular disease, lymphoma, leukaemia, metastatic cancer and rheumatoid arthritis.

The importance of identifying lymphadenopathy in the presence of a suspected cancerous lesion is that, lymphadenopathy signifies the spread of cancer cells beyond the confines of the tumour, and hence the need for more radical patient management.[13,23] Twenty-one non-specific masses were diagnosed in all age groups except the > 70 year age group. The greatest number 13 (61.9%), occurred in the 41-50 age group. Only 1 phylloides tumour (PHY) was diagnosed during the study period, and occurred in the 21-40 age groups.

Regarding the presenting symptoms recorded from available request forms, only 21 (11.7%) of the 180 cases studied had any symptoms recorded by their doctors. Eleven (52.0%) recorded pain, 7 (33.3%) swelling, and 3 (14.3%) with other symptoms such as nipple discharge, irritation and skin thickening. The lack of significant clinical history on the request forms, if any at all, is most likely as a result of the larger

number of screening examinations included in the study.

CONCLUSION

Majority of patients seeking mammographic evaluation were aged between 41 to 50 years. The large number of patients who undertook breast screening mammograms suggests that educational programs on early breast cancer detection are having a positive impact on the target population and need to be intensified to attract more females older than 50 years old. That 22.9% of lesions had features suggestive of breast cancer in the study is significantly high to also warrant intensification of the existing awareness programs.

Over half of the females who had mammograms had normal findings, which will serve as very important baseline information for comparison in future reviews. Non-specific masses were the most common radiographically observed lesions. Sonographies, short term follow-up mammographic evaluation and if necessary biopsy are therefore recommended for these individuals in order to obtain more specific diagnoses.

Hospitals are thus encouraged to have appropriate facilities to compliment their mammographic equipment. Greater interdepartmental collaboration especially with the pathology departments of hospitals is also recommend to confirm radiological diagnosis made as the knowledge of the pathology reports on suspected malignancies biopsied is relevant for future reviews. In this regard, it is hoped that in the near future, hospitals will be computerized and the various departments interconnected to enhance easy data accessibility and transfer between medical staff of the hospital.

REFERENCES

1. Jumah KB, Obajim MO, Darko R. Women with painful breasts without palpable masses: do they really need a mammogram? *Afr J Med Med Sci.* 2003 Dec; 32 (4) : 387-9.
2. Ministry of Health. Policy and Strategy Paper. 2001; Accra-Ghana.
3. Clegg-Lamptey J, Dakubo J, Attobra Y N. Why do Breast Cancer Patients Report Late or Abscond During Treatment in Ghana? A Pilot Study. *Ghana Med J.* 2009 Sep;43 (3) 127 - 131.
4. Wolfgang Dahnert. Breast Anatomy and Mammographic Technique . In: John JR, Snyder A, editors. Radiology Review Manual. 5th edition. Philadelphia:Lippincott Williams& Wilkins, 2002: 544 -7.
5. Wiredu EK, Armah HB. Cancer mortality patterns in Ghana: a 10 – year review of autopsies

and hospital mortality. *BMC Public Health* 2006 June;6:159doi:10.1186/1471-2458-6-159 (http://www.biomedcentral.com/1471-2458/6/159)

6. Clegg-Lamptey JNA, Hodasi W.M.. A Study of Breast Cancer in Korle Bu Teaching Hospital: Assessing the Impact of Health Education. *Ghana Med J.* 2007 June; 41(2): 72–7.

7. Ferlay J, Bray F, Pisani P, Parkin DM. GLOBOCAN 2002. Cancer Incidence, Mortality and Prevalence Worldwide. IARC CancerBase No. 5, version 2.0. IARCPress, Lyon, 2004. (assessed in April 2010)

8. Fregene A, Newman LA. Breast cancer in Sub-Saharan Africa: How does it Relate to Breast Cancer in African-American Women? *Cancer* 2005; 103 (No 8): 1540-50.

9. Duijm LE, Guit GL, Hendricks JH, Zaat JO, Mali WP. Value of breast imaging in women with painful breasts: observational follow up study. *BMJ* 1998 Nov 28; 317 (7171): 1492-5.

10. Peters F, Diemer P, Mecks O, Behnken LLJ. Severity of Mastalgia in Relation to Milk Duct Dilatation. *Obstet Gynecol* 2003. 101 (1) 54-60.

11. Rosen EL, Sickles, Keating D. Ability of mammogram to reveal nonpalpable breast cancer in women with palpable breast masses. *AJR Am J Roentgenol.* 1999 Feb; 172 (2): 309-12

12. Shetty MK, Shah YP, Sharman RS. Prospective evaluation of the value of combined mammographic and sonographic assessment in patients with palpable abnormalities of the breast. *J Ultrasound Med.* 2003 Mar; 22(3):263-8;269-70.

13. Ikeda DM. Mammogram Interpretation. In: Thrall JH, Surrena H, Bracken C, editors. Breast Imaging The Requisites.1st ed. Philadelphia: Elsevier Mosby, 2004: 24-59.

14. Michell MJ. The Breast. In: Sutton D, Whitehouse RW, Jenkins JPR, Davies RE, Murfitt J, Lees WR, editors. A Textbook of Radiology and Imaging. Vol.2. 6th ed. New York: Churchill Livingstone, 1998: 1456-7.

15. Samuel Yaw Opoku, Martin Benwell, Joel Yarney. Knowledge, attitudes, beliefs, behaviour and breast cancer screening practices in Ghana, West Africa. *The Pan African Medical Journal*. 2012;11:28

16. World Health Organization Disability Adjusted Healthy Life Epectancy: www.photius.com/rankings/healthy_life_table2.html (accessed June 2010)

17. Demographics of Ghana. Wikipedia, The free encyclopedia: http://en.wikipedia.org/wiki/Demographics_of_Ghana#Demographic_trends (accessed in February 2010).

18. Anim JT. Breast Diseases – Review of Surgical Material in the Korle Bu Teaching Hospital 1977 – 1978; *Ghana Med J.* 1979 Mar: 30 – 3.

19. Asumanu E, Vowortor R, Naaeder S. Pattern of Breast Disease In Ghana. *Ghana Med J*. 2000 Dec; 34 (4); 206-9.

20. Ohene-Yeboah MO. An audit of excised breast lumps in Ghanaian women. *West Afr J Med*. 2005 Jul-Sept; 24(3): 252-5.

21. Baako BN. Breast Cancer Screening in Ghana: Is There a Need? *Ghana Med J*. 1999 Mar; 33 (1) 9-12.

22. Gogo-Abite M. etal. Fibroadenoma coexisting with infiltrating ductal carcinoma – a case report. *Niger J Med*. 2005 Apr – Jun; 14 (2): 221-3

23. Clegg-Lamptey JN, Baako BN, Badoe EA. The Breast. In: Badoe EA, Archeampong EQ, da Rocha Afodu JT, editors. Principles and Practice of Surgery Including Pathology in the Tropics. 4th Ed. Dept of Surgery, UGMS 2009: 488-519. ✪