Table 1: Age and Sex Distribution of Patients with Thyroid Diseases in Sagamu, South West Nigeria

Age Range (Years)	Males Numbers of Cases	Females	Subtotal	Percentage (%)
0-10	0	0	0	0
11-20	0	1	1	**1.6**
21-30	0	15	15	**24.2**
31-40	0	15	15	**24.2**
41-50	3	13	16	**25.8**
51-60	2	4	6	**9.7**
61-70	0	2	2	**3.2**
71-80	1	5	6	**9.7**
81-90	1	0	1	**1.6**
Total	**7**	**55**	**62**	**100.0**

Table 2:Histological Types of Thyroid Diseases among Patients in the Study Population

Histologic Diagnosis	Number of Cases			Percentage (%)
	Males	Females	Subtotal	
Multinodular Goiters	1	28	29	46.8
Colloid Goiters	1	12	13	20.9
Toxic Goiters	1	4	5	8.1
Non Toxic Goiters	0	3	3	4.8
Benign Tumours	1	5	6	9.7
Malignant Tumours	3	3	6	9.7
Total	**7**	**55**	**62**	**100.0**

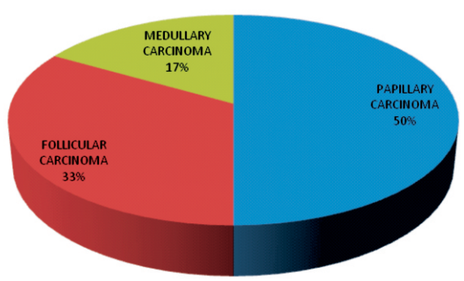

Figure 1: Histological Types of Thyroid Carcinomas

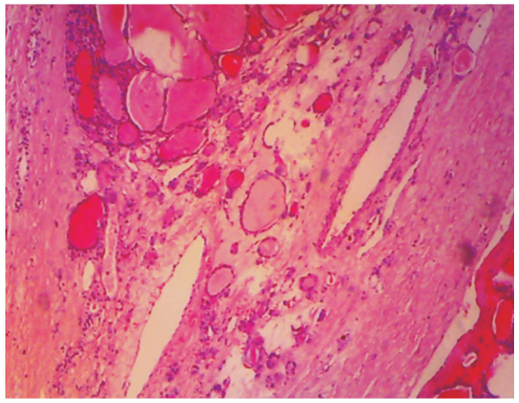

Figure 2: Photomicrograph of Thyroid tissue showing Multinodular Goiter, H & E x 100

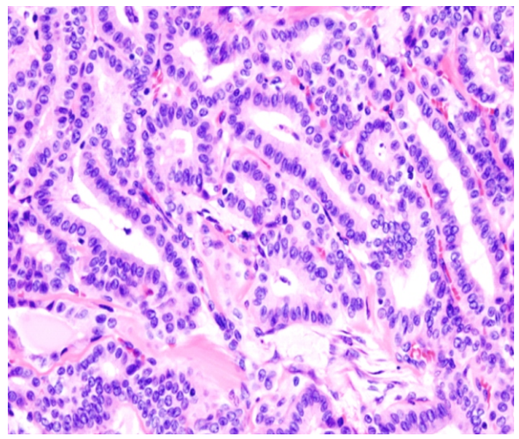

Figure 3: Photomicrograph of Thyroid tissue showing Papillary Carcinoma, H & E x 100

DISCUSSION

Thyroid diseases are not uncommon in Nigeria as demonstrated by the results of this study where 62 thyroid diseases were recorded, accounting for 2.2% of the total biopsies received during the period of the study. The frequency of thyroid diseases was nine cases per year. This rather low frequency contrasted with results from various parts of Africa, where the annual frequency of thyroid diseases ranged from 34.3 to 156 cases in Addis Ababa, Ethiopia; and annual frequency of 19.8 and 27.4 cases were recorded in Kano and Ile-Ife, Nigeria respectively[7,12,13,16]. Interestingly, Young in Sheffield, UK reported a much higher frequency of thyroid disease of 183.3 per year in his series [8]. These reports have however demonstrated that Africa probably has

4. Kingsnorth A, Oppong C, Akoh J, Stephenson B, Simmermacher R. Operation Hernia to Ghana. Hernia 2006; 10:376-9
5. Post S, Weiss B, Willer M, Neufang T, Lorenz D. Randomized clinical trial of lightweight composite mesh for Lichtenstein inguinal hernia repair. Br J Surg 2004; 91:44-8
6. Clarke MG, Oppong C, Simmermacher R, Park K, Kurzer M, Vanotoo L, Kingsnorth AN. The use of sterilised polyester mosquito net mesh for inguinal hernia in Ghana. Hernia. 2009;13:155-9
7. Ohene-Yeboah M, Abatanga F, Oppong J, Tobge B, Nimako B, Amaoh M, Azorliade R. Some aspects of the epidemiology of inguinal hernia in Kumasi, Ghana. Hernia. 2009;13:529-32.
8. Sanders DL, Porter CS, Mitchell KCD, Kingsnorth AN. A prospective cohort study comparing the African and European hernia. Hernia 2008; 12:527-9
9. Bhattacharjee PK. Surgical options in inguinal hernia: Which is the best? Indian J Surg. 2006; 68:191-200. Available from http://www.indianjsurg.com/textaspfi2006/68/4/191/27342
10. Simons MP, Aufenancher T, Bay-Nielsen et al. European hernia society guidelines on the treatment of inguinal hernia in adult patients. Hernia 2009; 13:343-403
11. Agbakwuru EA, Faponle AF, Adesukanmi ARK, Ogundoyin OO. Practice and acceptance of day-care surgery in a semi-urban Nigerian hospital. East Afr J Med. 2001;78:170-3
12. Schumpelick V, Stumpf M, Schwab R. Surgery of inguinal hernia as ambulatory and brief in-patient stay. Chirurg 2004;75: 126-30
13. Sadowski B, Rodriguez J,Symmonds R, Roberts J, Song J, Rajab MH, Cummings C, Hodges B. Comparison of polypropylene versus polyester mesh in Lichtensteinhernia repair with respect to chronic pain and discomfort. Hernia 2011;15:643-54

Although the optimum repair for inguinal hernia is yet determined, an adequate hernia repair requires a minimum of anaesthesia and surgery risk, cost, hospital stay, complication and recurrence.[9] The minimum anaesthetic risk, cost and duration of hospital stay for inguinal hernia repair can easily be achieved using local nerve or field block in an ambulatory setting. We previously repaired inguinal hernias in our institution under general anaesthesia but had to switch to nerve block for reasons of cost and our desire to adopt same day discharge to reduce the waiting period before surgery and manage the constraints of limited bed space. Our limited practice of day surgery has been very beneficial as our through-put for inguinal hernia has increased while the cost of the procedure has reduced. Ambulatory inguinal hernia repair is routinely practiced in developed economies and follows laid down guidelines[10] but is recent in Nigeria and studies show good outcome, minimal risk and patient acceptance.[11] Ambulatory hernia repair is cost effective, widely acceptable and in trained hands carries minimal complications.[12]

Various repair techniques have been practiced over time but the tension free hernioplasty is currently the technique of choice for hernia repair because of its low recurrence rate.[13] The Lichtenstein repair using on-lay mesh is most popular but rather expensive because of the additional cost of the mesh and so not widely practiced by surgeons working in resource poor settings. A limited study involving thirty patients employing polypropylene mesh done in Ife concluded that tension-free repair is well tolerated.[14]

Darning is an alternative tension free technique using non-absorbable sutures to weave a meshwork in the posterior wall of the inguinal canal. The procedure is a precursor to mesh repair, is cheap, effective and is tension-free. Its early and late outcome have been found in studies to be similar to other procedures for repair of primary inguinal hernia repair [15-18], with less post-operative cost, pain or septic complications.[19-21]

This study shows that in selected patients darning of inguinal hernias is associated with no recurrence at three years. Recurrence after inguinal hernia repair is an important outcome measure. Most recurrences occur in the first two years and account for a significant post repair morbidity and cost of subsequent repairs. Our result with darning would suggest the technique is effective in controlling the disease measured by the low recurrence rate we recorded. We believe the tension-free nature of the procedure contributed to this outcome. This technique would appear to have great potentials in the management of inguinal hernias in low income countries in Africa with a high prevalence of the disease.

Acute post operative pain is usual after hernia repair, in particular with bilateral repair. It often responds well to commonly prescribed analgesics. The use of nerve block techniques provides additional post operative analgesia. The absence of tension in the darning technique reduces the possibility of severe pain and is the likely reason we did not encounter chronic pain and its associated challenges. Wound complications were equally rare with this technique and we consider it a proper repair for inguinal hernia in a resource poor setting because it is cost effective.[22]

A major limitation of this study is the short duration of follow-up and limited number of patients. Hernia recurrence occurs even more than ten years post-repair and we will miss recurrences occurring after three years.

Conclusion

Darning is an effective and safe technique for inguinal hernia repair with minimal wound complication and recurrence rates at three years. We recommend the technique for hernia surgeons who do not have easy access to or whose patients cannot afford synthetic mesh.

REFERENCES

1. Ashindoitiang J, Ibrahim N, Akinlolu O. Risk factors for inguinal hernia in adult male Nigerians: A case control study. Int J Surg 2012;10:364-7
2. Hernandez-Irizarry R, Zendejas B, Rmairez T, Moreno M, Ali S, Lohse C, Farley D. Trends in emergent inguinal hernia surgery in Olmsted County MN: a population based study. Hernia 2012;16: 397-403
3. Sanders DI, Porter CS, Mitchell KCD, Kingsnorth AN. A prospective cohort study comparing the African and European hernia. Hernia 2008;12:527-9

lower incidences of thyroid diseases, when compared with their Caucasian counterparts. Notwithstanding, the very low incidence of thyroid diseases recorded in this study in Sagamu, Nigeria may be due to under reporting of cases, as some patients prefer to patronize traditional herbalists for treatment. The reasons for such preferences include poverty, ignorance and the relatively high user-fees charged in hospitals. It is important to also note that Sagamu, where the study was carried out is situated in a low land, where the soil may be rich in iodine salts resulting in a low incidence of non-malignant thyroid disorders, especially goiters.

The majority of thyroid diseases were non-neoplastic diseases which occurred in 50 (80.7%) cases. This finding compares favourably with the results of other studies in Nigeria and the United Kingdom, where rates of non-neoplastic diseases ranged from 79.0% to 92.1 %. [7,8,10,12,13,16,17] Benign and malignant thyroid tumours occurred in a ratio 1.0:1.0, which concurred with the report of a study in Ile-Ife, Nigeria where Nggada *et al* reported the same ratio in their study[12]. Conversely, Tsegaye and Abebe in Addis Ababa, Ethiopia recorded a preponderance of benign tumours, giving a ratio of 1.6:1.0 and 7.9:1.0 respectively[7,10]. The reasons for this disparity have not been addressed by this study; however, differences in environmental factors, differences in sample size, as well as differences in the population studied could have contributed to this discordance.

The mean ages of patients who presented with thyroid diseases from various parts of the world varied from 32.2 to 42.0 years of age, which is comparable with the mean age of 42.9 $\pm$ 2.03 years and lies within the peak age incidence of 21-50 years age group (74.2%) recorded in this study. [6, 10, 11, 13] These findings also concur with studies in Addis Ababa, Ethiopia where a peak age incidence ranging from 20-30 years to 30-40 years of life for thyroid diseases was recorded. [7,10, 13] There were 7 males and 55 females giving a male to female ratio of 1.0:8.0, which concurred with most reports showing female preponderance, with a male to female ratio ranging from 1:1.3 to 1.0:6.0. [1, 5 – 13] Additionally, the equal male to female ratio obtained for malignant tumours in study population is similar to findings by Nggada[12] in Ile Ife, Nigeria, but discordant to reports from many other studies[2,7-9,12, 17,19].

From the foregoing, it is obvious that there is an increased demand for iodine in females within the age group (20-45yrs) in response to some physiological sexual activities including menstruation and child bearing. On the other hand, relationship between thyroid hormones and physiological sexual activities in post-pubertal males especially spermatogenesis is still doubtful and require more researches in this area.

Multinodular goiter was the most common thyroid disease (46.8%) and ranked the leading non-neoplastic disease (58%). Colloid goiters, toxic goiters, goiters, and non toxic goiters were the other types seen in 26.0%, 10.0% and 6.0% cases respectively. These results were comparable to findings by Tsegaye[7] and Abebe[10] in Addis Ababa, Ethiopia, where they reported nodular colloid goiter (NCG) as the most frequent non neoplastic disease in 76.9% and 80.0% of cases respectively[7,13]. On the other hand, non-toxic simple goiters were the leading non-neoplastic thyroid lesion in Sheffield, UK (53.0%) and Garbon, Sub-Sahara Africa (54.7%)[2,8]. From the foregoing, it is obvious that predominant type of goiters differs from region to region but the underlying aetiological factors are almost the same. These include deficiencies of iodine and other minerals including selenium, use of drugs like thiocyanates and propylthiouracil as well as increase demand for thyroid hormones at the expense of deficiency of iodine [1-5,13].

Benign tumours were predominantly follicular adenoma, accounting for 6 out of 12 cases of neoplastic diseases, which agrees with reports from Kano, Nigeria, Addis Baba, Ethiopia and Houston, USA, but contrasts with results from other studies in Addis Baba, Ethiopia and Sheffield, UK, where Hurtle cell tumour was the most common benign tumour in those series. [7,8,11,13,16]

Papillary carcinoma was the most frequent malignant disease, accounting for 3 out 6 cases of malignant tumours which concur with findings of Tsegaye *et al.*[7] *in Addis Baba, Ethiopia,* Kountakis *et al.*[11] in Houston, USA, and Gorges in Germany, who reported papillary carcinoma as the most frequent thyroid

malignancy in their studies [7, 9, 11]. In contrasts, follicular carcinoma was the leading carcinoma in

Adelusola K. Thyroid malignancy in endemic nodular goitres: prevalence, pattern and treatment. *Eur J Surg Oncol, 2001,*Nov; 27(7):699.

18. Aghini-Lombardi F, Antonangeli L, Martino E, Vitti P, Maccherini D, Leoli F, Rago T, Grasso L, Valeriano R, Balestrieri A, Pinchera A. The Spectrum Of Thyroid Disorders In An Iodine-Deficient Community: The Pescopagano Survey. J Clin Endocrinol Metab. 1999 Feb; 84 (2):561-6.
19. Sant M, Aareleid T, Berrino F, Bielska Lasota M, Carli PM, Faivre J, Grosclaude P, Hedelin G, Matsuda T, Moller H, Moller T,Verdecchia A, Capocaccia R, Gatta G, Micheli A, Santaquilani M, Roazzi P, Lisi DEUROCARE Working Group EUROCARE-3: Survival of cancer patients diagnosed 1990-94: results and commentary. Ann Oncol. 2003; 14(5): 61-118.
20. Evangelina R. Pipo and Ma. Yvette R. Amante. The Detection Of Follicular Variant Of Thyroid Papillary Carcinoma and Follicular Carcinoma of the Thyroid By Fine Needle Aspiration Biopsy And Frozen Section: *A Three-Year Comparative Review*; *Phil. J. Internal Medicine, 2006 July-August; 44:167-73.*

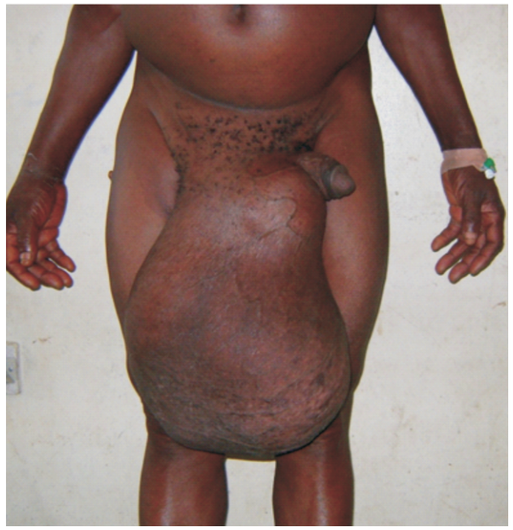

Plate I : A typical inguinal hernia seen in Africans, often of large size containing a large amount of intra-abdominal contents.

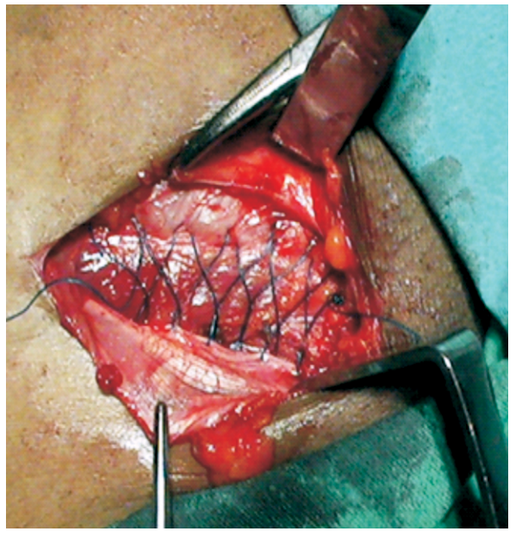

Plate II: First layer of darning placed at repair of inguinal hernia in a female patient.

Table 1 : Inguinal hernia is common among young males and occurs more on the right side

Characteristics	Frequency (%)
Sex	
Males	49 (75.4)
Females	16 (24.6)
Age group (Yr)	
16 -40	29 (44.6)
41 -60	27 (41.5)
>61	9 (13.8)
Side	
Right	33 (50.7)
Left	21 (32.3)
Bilateral	11 (16.9)
Complications	
Pain	33 (50.7)
Wound haematoma	1 (1.5)
Stitch granuloma	6 (9.2)
Wound infection	0 (0)
Recurrence	0 (0)

DISCUSSION

A simple, cheap, safe and effective elective repair technique for inguinal hernias is of utmost importance in the west Sub-Saharan region to serve as part of an integrated approach to encourage more patients to have early elective hernia repair as a means to controlling this pathology which places a huge burden on the economic growth of many African countries. Inguinal hernia predominantly affects the productive age group of the economy (see table 1), especially in males in farming communities. The epidemiology of inguinal hernia in the African continent is markedly different from that in Europe and North America; hernias in the continent are larger, of longer duration and more than 70% of repairs are done on emergent bases[7,8,] with a high rate of bowel resection, morbidity and mortality. The cost of repair and proximity of health facilities are contributory to this situation.

PATIENT AND METHODS

Setting

The Department of Surgery of the University of Uyo Teaching Hospital, Uyo.

Inclusion Criteria

Patients aged 18-70 years in American Society of Anaesthesiology (ASA) class I and II presenting with simple unilateral or bilateral inguinal hernia and who accept ambulatory repair by darning.

Exclusion Criteria

ASA III and IV patients, presence of obstruction or strangulation, or a large hernia requiring general surgery and admission.

Consent

A formal consent was obtained from patients enrolled into the study after adequate explanation of the procedure by a member of the study group

Ethical Approval

Approval to conduct the study was obtained from the institutional review committee.

METHODS

Patients presenting with a diagnosis of simple inguinal hernia at the out-patient clinic were recruited into the study after adequate counselling by the lead surgeon and consent to undergo a darn repair obtained. A minimum of full blood count and urine analysis was done for all patients, those older than 50y had a chest X-ray also. They were booked for ambulatory hernia repair and advised to come with an adult escort on the scheduled operation date in a fast. In theatre a member of the group reviewed the patient records, diagnosis and investigation results, examined and marks the operation site.

The hernia repair was done under ilio-inguinal nerve block using 1% xylocaine with or without adrenalin which was surgeon administered. A standard open inguinal incision was made, haemostasis secured, the spermatic cord freely mobilised and the hernia sac dissected free, its contents reduced and high ligation and excision of the sac done. Reconstruction of the transversalis fascia and narrowing the internal ring was done with chromic catgut 0. Size 0 polypropylene suture was used to weaving a darn in the posterior wall of the inguinal canal (Plate II) in two layers commencing medially from the pubic tubercle moving laterally, picking the inguinal ligament and the external oblique muscle and aponeurosis without tension, to 2cm past the the internal ring and returning to the pubic tubercle and the knotted. A layered closure of the soft tissue was done with subcuticular skin closure.

The patient was discharged after two hours observation in the recovery room in care of the escort after instruction on post-operative medication and care had been discussed with both. They were reviewed at one week in the clinic and skin sutures removed. Further reviews were scheduled for four and twelve weeks and subsequently by six monthly phone calls for a minimum duration of three years, thereafter a physical examination will be required only if symptoms of a recurrence of the swelling is reported.

Data on the age, sex, evidence of wound complications (bleeding, haematoma, infection, and stitch sinus), pain and recurrence of a swelling at the same site will be recorded.

Data Analysis

Data analysis will be done using SPSS 17 using descriptive statistics and presented as simple percentages, ratios, charts and tables.

RESULTS

A total of 76 inguinal hernias were repaired in 65 patients, predominantly involving young males. Post-operative pain was the most common complication reported and was more in patients with bilateral repair. We did not encounter recurrence in three years.

Prevalence and Public Health Implications of Intestinal Parasites of Dogs in an Urban Area of Akwa Ibom State, South-South, Nigeria

***Umo AN[1], Atting IA[1], Udokainyang AD[2], Umana OU[3]**

ABSTRACT

Dogs are known to perform series of functions that are beneficial in the human society and also have been known to cause environmental contamination and inconveniences as a result of their defaecation and urination. In addition, these dogs habour a variety of potential pathogenic intestinal parasites that constitute major threat to public health. A total of 328 faecal samples of dogs obtained by house to house collection were examined microscopically. The overall prevalence was 61.6%. Six helminth parasites namely Toxocara canis, Diphyllobotrium latum, Dipylidium caninum, Ancylostoma spp, Uncineria stenocephala and Strongyloides stercoralis were recovered. Dogs from the ages of 60 months and above had the highest prevalence of 19.2% while those not more than 12 months recorded the lowest prevalence of 10.4%. There was no statistical significant difference in the sex-related prevalence. Dogs should be checked from depositing their faeces in areas like playgrounds where children come in contact with them. Regular mass faecal examination for dogs is also strongly advocated.

Keywords: Prevalence, Intestinal parasites, Public Health Implications, Akwa Ibom State.

INTRODUCTION

Dogs are the most successful canids adapted to human habitation worldwide[1] and they are known to perform series of cultural, social and economic functions in the human society[2]. In spite of their beneficial effects, dogs have also been known to cause a range of environmental problems in the community. These include environmental contamination and inconvenience as a result of their defaecation and urination[3]. In addition to causing environmental contamination, dogs like many canines have been reported to harbour a variety of intestinal parasites, some of which can infect livestock, wildlife and humans, and as such they constitute a major threat to public health[4,5]. Some of the zoonotic infections include cutaneous larval migrans, tungiasis and hydatid disease.[6,7,8] Several reports have documented prevalence of dog parasite in various locations around the world.[9-14] Some of these intestinal parasites of dogs include *Toxocara canis, Ancylostoma braziliense, A. caninum*[15,16]. Because of the increased risk of exposure to these zoonotic infections resulting in an equally increased disease transmission and poor level of hygiene in the community, this study therefore aims to estimate the prevalence of intestinal parasites of dogs in an urban area of Ikot Ekpene in Akwa Ibom State, South-South of Nigeria. This is in order to properly educate the public and also provide a guide in establishing more preventive measures against such diseases.

MATERIALS AND METHODS

Study Area

This study was carried out in the Government Residential Area (GRA) of Ikot Ekpene urban and the bordering villages of Ikot Obong Edong, Nkap and Ifuho, all in Akwa Ibom North West Senatorial District. The study was conducted within 6 months, from August 2011 to February 2012 in the bordering villages of Ikot Obong Edong, Nkap and Ifuho, all in Akwa Ibom North West Senatorial District.

Collection of Samples

A house-to-house sample collection method was employed in collecting an average of 5g of fresh faecal samples into clean, dry universal containers from apparently healthy dogs after obtaining the consent of their owners. Careful attention was paid to the collection of the dog faeces so that each specimen was from a different dog. The aims and rationale of the investigation were carefully explained to the dog owners thereby getting their full cooperation and understanding and these made it possible to ensure that faeces from humans or other animals were not substituted for those of dogs.

Department of Medical Microbiology and Parasitology[1], Faculty of Clinical Sciences, College of Health Sciences, University of Uyo, Nigeria. Department of Animal Production[2], Federal College of Animal Health and Production Technology Vom, Nigeria, Department of Science Laboratory Technology[3], Heritage Polytechnic, Ikot Udoata, Eket, Nigeria

*Corresponding author: unilabs1@yahoo.com

Darning: An Effective and Safe Technique for Open Inguinal Hernia Repair in Resource Limited Settings

***Udo IA, Akpanudo E**

ABSTRACT

Current practice recommends the use of bio-prosthesis for inguinal hernia repair because of its low recurrence rates and ease of repair. These materials are expensive and not readily available to hernia surgeons practicing in low income countries. Alternative repair techniques are often employed for hernia repair in these countries. We assessed for the effectiveness of polypropylene darning technique as an alternative tension-free repair in fit young adults. Healthy adults in ASA I and II presenting with simple inguinal hernia were scheduled to undergo ambulatory two-layer polypropylene darn repair of the posterior wall of the inguinal canal and were followed for three years for evidence of pain, wound haematoma, wound infection, stitch sinus, bleeding or hernia recurrence. Seventy six repairs were done in 65 adult patients; 49 males and 16 females. Acute pain was complained of by 33 (50.6%), stitch sinus/granuloma by 6 (9.2%) and wound haematoma by 1 (1.5%) patient. No cases of wound infection or hernia recurrence were recorded in three years. Darning is an alternative, effective and safe tension-free technique for repairing the posterior wall of the inguinal canal in the absence of prosthetic bio-materials.

Keywords: Inguinal hernia, darn repair, tension-free, safe, effective.

INTRODUCTION

Inguinal hernia is the most common form of abdominal wall hernia. The pathology predominantly affects males with a lifetime risk of 27% compared to 3% in females.[1] In the USA approximately 800,000 hernias are repaired annually, most as elective surgery.[2] Inguinal hernias in Africans are frequently larger in size (Plate I), of longer duration and less likely to be repaired when compared to the disease in Caucasians; most present with obstruction or strangulation[3] with mortality of nearly 90% for cases not seen in hospital and 40% for hospital cases.[4] Hernias contribute significantly to poor economic outlook of the continent.

The optimal surgical repair for inguinal hernias is not determined. Best evidence strongly recommends tension free repairs because of its low recurrence. In particular, the Lichtenstein technique is popular in developed economies. This technique is easy and simple to learn, is done on an ambulatory basis and the post-operative recurrence rate is low.[5] Prosthetic materials for open tension-free hernia repair are however expensive and not widely available[6] in the West African sub-region and the technicalities of the repair are not commonly available. Therefore open tension repairs, which are associated with high hernia recurrence rates, are still commonly practiced in the sub-region.

An alternative but simple tension free repair technique using sutures is darning. It is cheap, the materials for repair are readily available and the technique can easily be learnt and practiced.

Where properly and appropriately executed, darning produces outcomes similar to and as effective as mesh repair in reducing the incidence of hernia recurrence. Maloney's darning technique involves a two-layered darning. This technique employing either nylon or polypropylene sutures could suffice for inguinal hernia repair in resource poor settings pending the availability and affordability of synthetic mesh as well as acquisition of the technical skills for tension free mesh repair for inguinal hernia.

This is an observational study with the intention to treat, carried out over a minimum period of four years and will evaluate the early (bleeding, haematoma, stitch sinus and wound infection) and late (chronic pain and hernia recurrence) outcome measures of inguinal hernia repair using polypropylene darning technique as an option of tension-free repair. It will be limited to only patients in ASA I and II as an ambulatory procedure.

Departments of Surgery, University of Uyo Teaching Hospital, Uyo -Nigeria

*Corresponding author: nsoyoudo@yahoo.com