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MANAGEMENT OF SOLITARY THYROID NODULES IN RURAL AFRICA

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ABSTRACT

**Objectives:** To review a simple protocol for the management of solitary thyroid nodules and to document the spectrum of pathological diagnoses associated with this condition.

**Design:** A retrospective review of all solitary solid thyroid nodules excised over a three-year period from 1st January 1999 to 31st December 2001.

**Setting:** A rural church-based hospital in Kenya.

**Subjects:** All patients undergoing thyroidectomy for solitary solid thyroid nodule over a three-year period at Kijabe Hospital.

**Interventions:** A simple protocol was used to manage this condition involving history, clinical examination, needle aspiration of the lesion, and excision when clinically indicated.

**Main Outcome Measures:** Clinical diagnosis, tribe, operation performed, pathology, and complications of surgery.

**Results:** Eighty-one operations were performed for a solitary thyroid nodule. The most common operations were lobectomy and isthmusectomy. There were two complications—a neck haematoma that required surgery and one recurrent laryngeal nerve injury. The commonest pathological diagnosis was multinodular goitre (42%). There was a 16% malignancy rate with eight papillary carcinomas, five follicular carcinomas, and one hurthle cell carcinoma.

**Conclusions:** The simple protocol described gives good results in a rural African hospital. Solitary solid thyroid nodules should be routinely excised due to the 16% malignancy rate in this condition. There is a possibility that there is a shift in the ratio of papillary to follicular carcinomas compared to older African studies and this would be an interesting area for further study.

INTRODUCTION

Solitary thyroid nodules are a common clinical finding. Although accurate figures are not available for Kenya, palpable thyroid nodules are detected in 0.8%-1.5% of men and 5.3%-6.4% of women(1). Although the majority of these are benign, a significant number are malignant and prognosis depends upon timely and appropriate investigation and management.

In the developed world, a number of advances in diagnosis and treatment of thyroid nodules and thyroid cancers have occurred over the last few years that have not been translated into clinical practice in rural Africa due to cost and availability outside of major centres. These include radioactive iodine for diagnosis and treatment, thyroglobulin estimation, ultrasonography, and fine needle aspiration cytology (FNAC)(2,3). These advances in the management of thyroid nodules and thyroid malignancy have resulted in a complex algorithm, which is unable to be implemented outside the major teaching institutions of East Africa.

At Kijabe Hospital approximately 100 thyroid operations are performed each year. A comprehensive pathology database and well-kept operative log enable us to keep accurate records regarding these patients. The aim of this study was to analyse the results of a simple protocol for the management of solitary thyroid nodules.

MATERIALS AND METHODS

Patients reporting to Kijabe Hospital complaining of a neck lump are initially evaluated by a clinical officer or general practitioner. Thyroid function tests are ordered selectively and the patient is referred to the surgical clinic, where a history is taken and the patient is examined with an emphasis on symptoms and signs of hyperthyroidism, malignancy or multinodularity. If the patient is hyperthyroid, then they are rendered clinically euthyroid with carbimazole and beta-blockade. The nodule is aspirated with a fine needle. A clear aspirate and disappearance of the lump leads to a further appointment at six weeks. If the lump recurs or the lump is solid the patient is offered surgery, which is generally a lobectomy plus isthmusectomy or a near total thyroidectomy,

consisting of a lobectomy on the affected side and a subtotal lobectomy on the opposite side. Total thyroidectomy in the first instance is rare for this condition and lymphadenectomy is reserved for clinically malignant lymphadenopathy. The recurrent laryngeal nerve is routinely sought. No drains are used and the specimen is sent for pathology. Patients remain in hospital for two to three days postoperatively and are then discharged.

The operative log, pathology records, and the individual records of the two surgeons in the unit were checked for all thyroid operations performed for a two year period, between the 1st of January, 1999 and 31st of December, 2001. Patient notes were then checked for clinical diagnosis, tribe, operation performed, pathology, and complications of surgery.

## RESULTS

Two hundred and twenty two patients underwent thyroidectomy during the study period. Of these, 81 were for solitary solid thyroid nodule on clinical assessment. The pathology results can be seen in Tables 1 and 2. As can be seen the commonest pathological diagnosis for a clinically solitary solid thyroid nodule was multinodular goitre (MNG). There was a 12% malignancy rate overall and a 16% malignancy rate in solitary nodules.

**Table 1**

*Pathology of all thyroid specimens from Kijabe Hospital*

Pathology	No. (%)
Multinodular goitre	105 (47)
Follicular adenoma	47 (21)
Graves' disease	29 (13)
Papillary carcinoma	15 (7)
Follicular carcinoma	10 (5)
Follicular cyst	1 (0.5)
Hurthle cell carcinoma	1 (0.5)
Pathology report not available	14 (6)
<b>Total</b>	<b>222 100</b>

**Table 2**

*Pathology of solitary solid thyroid nodules*

Pathology	No. (%)
Multinodular goitre	34 (42)
Follicular adenoma	31 (38)
Papillary carcinoma	8 (10)
Follicular carcinoma	5 (6)
Cyst	1 (1)
Graves' disease	1 (1)
Pathology report not available	1 (1)
<b>Total</b>	<b>81 100</b>

The commonest operation for a clinically solitary solid nodule was lobectomy and isthmusectomy (Table 3). Two isthmusectomies were performed for central lesions. There were only two complications (2.5%). There was one haematoma that required evacuation and one recurrent laryngeal nerve injury. No permanent hypoparathyroidism was noted. Mean postoperative stay was 2.7 days.

**Table 3**

*Surgical procedure performed for solitary solid thyroid nodules*

Operation	No. (%)
Lobectomy and isthmusectomy	51 (63)
Subtotal (lobectomy and subtotal on contralateral side)	23 (28)
Total	3 (4)
Isthmusectomy	2 (2)
Not stated	2 (2)
<b>Total</b>	<b>81 100</b>

**Table 4**

*Tribal distribution of thyroid carcinoma patients*

Tribe	All Thyroid Patients (n=222)(%)	Follicular and Hurthle Cell Carcinoma (n=11)(%)	Papillary Carcinoma (n=15)(%)
Kikuyu	136 (61)	4 (36)	6 (40)
Kamba	30 (14)	2 (18)	5 (33)
Somali	19 (9)	3 (27)	0
Maasai	8 (4)	0	1 (7)
Embu	5 (2)	0	0
Luo	4 (2)	2 (18)	0
Congolese	3 (1.5)	0	0
Kalenjin	3 (1.5)	0	1 (7)
Others	6 (3)	0	1 (7)
Not Stated	8 (4)	0	1 (7)

There was a very strong tribal bias in presentation to the hospital. Kikuyu was the commonest tribe, reflecting the local area, and the overall malignancy rate in this group was 7% (Table 4). Kijabe has a large Somali practice and these patients had a high (16%) overall malignancy rate. This might not be strategically significant because of the small number of patients. Interestingly in this group of patients along with those from the Luo tribe, only follicular carcinomas were found. In the Bantu tribes of Kikuyu and Kamba, papillary carcinoma was much more common than follicular carcinoma (11 versus 6).

## DISCUSSION

Solitary thyroid nodule is a common problem presenting to surgeons throughout Africa. At Kijabe, surgery is performed for all solitary solid thyroid nodules and is associated with a 2.5% complication rate, and a postoperative stay of 2.7 days. The malignancy rate in solitary solid thyroid nodules is 16%.

In this study solitary nodules clinically were dominant nodules in MNG in 42% of cases. It is therefore possible to make a case for ultrasound scanning in the work-up of these patients to exclude patients with MNG from surgical intervention. However, 11% of the 74 clinical MNG, without dominant nodules contained carcinoma (data not shown). Thus care is required if an expectant policy is to be entertained in this situation.

The issue of subtotal versus total thyroidectomy for differentiated thyroid cancer (DTC) or MNG remains unclear due to the absence of randomised controlled trials. Each operation has its advocates(2,4). The reason for performing a total thyroidectomy for MNG is to eliminate the risk of long-term recurrence which then required a second more dangerous operation. In DTC, the principal reasons for a total thyroidectomy over a subtotal thyroidectomy are postoperative follow up and adjuvant treatment, both of which require radioactive iodine(3). This is available in Nairobi but is not easy for the majority of rural Kenyans to receive. Thus the argument in favour of total thyroidectomy for DTC is weak in our context, although removing the contralateral lobe will remove areas of multifocal carcinoma, particularly in papillary carcinoma. The survival advantage in doing this only, that is, without adjuvant therapies, is not known. In the rare case where it is deemed necessary to do so, a completion thyroidectomy is possible and relatively safe(5).

In our hands total thyroidectomy is performed rarely (4% in the present series) as we believe that it is not an appropriate operation in rural Africa in the majority of circumstances. Although we believe that the operation is safe in experienced hands, patients are committed to a lifetime of thyroxine replacement and are at risk of hypoparathyroidism, which is difficult to treat in rural Africa. In addition, the remote possibility of bilateral recurrent laryngeal nerve injury is a very real concern in this context. In a paper from Kenyatta National Hospital the recurrent laryngeal nerve damage rate was over 3%(6). This represents the situation in a busy teaching hospital in Kenya and less experienced surgeons may well find their rates even higher. The one case of recurrent laryngeal nerve injury (1.2%) in this study was by an inexperienced visiting surgeon. This must be borne in mind in units where thyroidectomy is not as common as at Kijabe. It may be appropriate that one surgeon in the unit develop an interest in this

area to make sure that an adequate experience is gained. At Kijabe we have done this for breast surgery, cholecystectomy, and for difficult urology such as urethroplasty and transurethral prostatectomy.

FNAC is regularly used in large Western studies and is available in some African teaching hospitals(7-9). There is little doubt that this technology is useful in the management of solitary solid thyroid nodules(1,3). However, in East Africa cytology is not common nor easily available outside of the larger cities and this situation is unlikely to change in the near future.

It is interesting to note that in this study papillary carcinoma was more common than follicular carcinoma. This is in contrast to previous studies from East Africa(6,9,10). Similar increases in the ratio of papillary to follicular carcinoma have been noted in Nigeria and attributed to socio-economic and environmental factors(11). Iodisation of salt was introduced to Kenya in 1970 and this may have had the effect of changing the ratio of these two malignancies. In previous studies the rate of malignancy in solitary thyroid nodules was 15% and this is not different to the rate in this study so the absolute number of malignancies may not have decreased(9). Geographic and/or tribal variations in pathology are suggested in this study but small numbers make conclusions difficult to draw.

Anaplastic carcinomas were not seen in this series of operative cases. The reason for this is that patients with these very poor prognostic tumours were not offered surgery, once a diagnosis had been made, usually by core biopsy. At least two cases of anaplastic carcinoma were observed during the study period.

This study, has shown that a simple protocol for the management of solitary solid thyroid nodules is safe and effective. In light of the malignancy rate of 16% in this study, surgery is mandatory for patients with a solitary solid thyroid nodule. Without FNAC it seems unlikely that this situation is going to change in the near future in rural African hospitals. The operation of choice is either a lobectomy plus isthmusectomy or a subtotal thyroidectomy and these operations have good results in the hands of a well-trained general surgeon. Routine total thyroidectomy is inappropriate in the majority of cases in rural Africa. Further study appears warranted in relationship to geographical distribution and temporal changes in differentiated thyroid carcinoma.

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## ANNOUNCEMENT

### THE KENYA MEDICAL ASSOCIATION 31ST ANNUAL SCIENTIFIC CONFERENCE AND ANNUAL GENERAL MEETING

**Hosts:** Kenya Medical Association  
– Mombasa Division

**Venue:** Travellers Beach Hotel, Mombasa

**Date:** 23rd – 27th April, 2003

**Theme:** Current Trends in Treatment and Prevention of HIV/AIDS and other Diseases in sub-Saharan Africa

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