



Giant Euthyroid Goitre: Clinical Profile as Seen in Otorhinolaryngology Department of a Tertiary Health Institution, in Northwestern Nigeria

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Authors' contributions

This work was carried out in collaboration among all authors. Author DA designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors KRI and SBA managed the analyses of the study and authors YSS, JHS and FMA managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Background: Goiter refers to a diffuse enlargement of thyroid gland. It has a high prevalence in adult population in endemic areas where iodized salt is not part of the regular diet.

Aim: We report the clinical profile of giant goiters seen in a tertiary hospital in Northwestern Nigeria.

Methods: A prospective study of all surgically operated cases of goiter carried out in a tertiary health hospital in Northwestern Nigeria, over a period of 6 years between January 2011 and December 2016. Bio data, duration of goiter, symptoms, geographical location, thyroid function tests, radiological reports and treatment were recorded and analyzed.

Results: Ninety-Seven patients were operated for goitre during the study period. Out of these 19 (19.6%) were giant goitres weighing between 900g-3200g. There were 13 (68.4%) females and 6

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(31.6%) males with M: F ratio of 1:2.2. Age range was between 39 – 71 years with a mean age of 53.2 years. Prevalence was high in the 41-60 year age group. Duration of goiter in 13 (68.4%) of patients was between 11-20years. Retrosternal extension was observed in 7 (36.8%) patients. Tracheal deviation was the most common risk factor for respiratory complication in all the patients followed by tracheomalacia in 8(42.1%). Postoperative temporary Tracheostomy was carried out in 4(21.1%) of patients. Recurrent laryngeal nerve injury occurred in 2(10.5%). No mortality was recorded.

Conclusion: Respiratory complications are commonly associated with giant goiters, a pathology that is entirely preventable if diagnosed and managed at an early stage.

Keywords: Giant goiters; respiratory complication; iodized salt; tracheal deviation.

1. INTRODUCTION

Thyroid gland is the largest discrete endocrine gland in the body, weighing 15-25 g [1,2]. It lies in the anterior triangle of the neck, consisting of two lobes separated by an isthmus. Thyroid hormones, tri-iodothyronine (T_3) and L-thyroxine (T_4) synthesized by the thyroid gland drives the body's metabolic processes, affects protein synthesis and regulates growth [1,3]. Goiter refers to enlargement of the thyroid gland. It is derived from the Latin word *guttur*, meaning throat. It is a term used to denote nonspecific enlargement of the gland. Goiters become visible when they become three times or more of their size (about 50g). Enlargement of the gland could be from Hyperthyroidism, Hypothyroidism, Simple Goiter (Euthyroid), Inflammatory conditions or Neoplasia [1,4].

Decrease in thyroid hormones or a pituitary adenoma may cause sustained stimulation of all lobules of the thyroid gland by Thyroid stimulating hormone (TSH). This causes a reversible and diffuse enlargement of the gland. As the condition persists, there is a non-uniform stimulation of the gland with fluctuations in TSH, resulting in active and inactive lobules, eventually giving rise to multinodular goiter [1,4]. A simple goiter may initially present as an asymptomatic anterior neck mass, but if left unattended to, features of obstruction such as difficulty with swallowing, difficulty with breathing, hoarseness, engorgement of neck veins may follow as the increased size of the goiter compresses on nearby structures [5,6]. Gyoh and Emery defined giant goiter as that which protrudes beyond the chin or jaw [7]. There is no consensus on the definition of a giant goiter in objective terms as it relates to its size or weight [6,8,9]. The prevalence of goiter varies according to age, sex and geographical locations. A study suggests a prevalence of 8-65% in autopsy data, 19-35% with ultrasound and 2-6% with palpation. [4].

India is reported to have the world's largest goiter belt in sub-Himalayan region with palpable goiter occurring in an estimated 12% of adult population. In endemic regions of the world the prevalence of goiter is still a public health challenge despite the emergence of iodization [4].

Giant goiters are associated with significant morbidity and mortality. They are prone to respiratory problems, pre-operatively, intra-operatively and post-operatively. This is due to tracheal compression or displacement with difficult intubation and postoperative tracheomalacia respectively [10,11]. The difficulty with swallowing may predispose these patients to nutritional deficiencies, making them poor surgical candidates. Multiple endocrine abnormalities such as decrease level of thyroid hormones and increased thyroid size are consequences of poor nutritional status. It is the resultant dysphagia that often leads patients to seek for medical care. The surgery for these patients may also be technically difficult with a high risk of damage to surrounding structures such as the recurrent laryngeal nerve [8,12].

Though several treatment modalities exist, surgical excision is preferred in patients with giant euthyroid goiters. This leads to immediate resolution of obstructive symptoms and restores the aesthetics of the patient's neck [7,8]. Different surgical options are available, but there is still controversy in the selection of preferred surgical method [12,13]. For a long while, many surgeons practice Sub-total thyroidectomy, which involves removal of both thyroid lobes and isthmus, leaving behind only about 8g on both sides. This preserves some thyroid tissue, just enough to sustain the adequate hormone levels, and not too much to prevent recurrence [1,14]. However despite this, recurrence may occur, necessitating complete excision of the remnant thyroid tissue. Total thyroidectomy involves

removal of both thyroid lobes and isthmus. There are no chances of recurrence with this technique, however, the risk of loss of the parathyroids, the need for lifelong L-thyroxine, and the risk of damage to both recurrent laryngeal nerves makes some surgeons to prefer sub-total thyroidectomy instead. Where only one lobe is involved a near total thyroidectomy may be offered to the patient [1]. Worldwide the commonest indication for surgery in a patient with goiter is cosmesis. Others are suspicion of malignancy, large goiter causing pressure symptoms, among others [1,2,15,16]. However, among the patients with euthyroid goiter in our environment, cosmesis is an indication for surgery, yet many of them cannot afford. Though desirous of good looks, many of them stay away from the hospital for long periods and only present when they have life threatening obstructive symptoms. This may be attributed to their inability to pay for orthodox medical care, myths and traditional beliefs or a combination of both. We present the clinical profile of patients that had surgery for giant goiters over a 6-year period in a tertiary hospital in Northwestern Nigeria.

2. METHODOLOGY

This was a prospective study of all patients that had surgery for goiter at the ENT Department of Usmanu Danfodiyo University Teaching Hospital, Sokoto over a period of 6 years (January 2011 and December 2016). The ENT department of Usmanu Danfodiyo University Teaching Hospital receives and treats patients from Sokoto, Kebbi, Zamfara and parts of Niger states. Giant goiter was defined as that which protrudes beyond the chin or jaw on clinical examination. Relevant data of patients were recorded. This included; biodata, duration of goiter, clinical features, geographic location, thyroid function tests, plain radiographs of the neck, type of surgery offered, histology of specimen and outcome. All patients had laryngoscopy done to assess vocal cords mobility. Data was analyzed using Statistical Package for the Social Sciences (SPSS) version 23.

3. RESULTS

Ninety-Seven patients were operated for goiter during the study period, of which 19 (19.6%) were giant goiters. There were 13(68.4%) females and 6(31.6%) males with M: F ratio of 1:2.2. Age range was between 39 – 71 years with a mean age of 53.2 years. Prevalence was high in the age group 41-60 years (see Table 1).

The giant goiters ranged between 900 g to 3200 g in weight (Table 2). Patients were from Sokoto, Kebbi, Zamfara and Niger states. Two of the patients were from the Southeastern part of the Country.

Patients generally presented late to the hospital. Duration of goiter before presentation in 13(68.4%) of patient was between 11-20years (see Table 3). All patients were euthyroid. Apart from the neck ultrasound, all patients had plain x-rays soft tissue neck, which confirms deviation and Narrowing of the trachea [Fig. 3].



Fig. 1. Giant goiter in a male patient

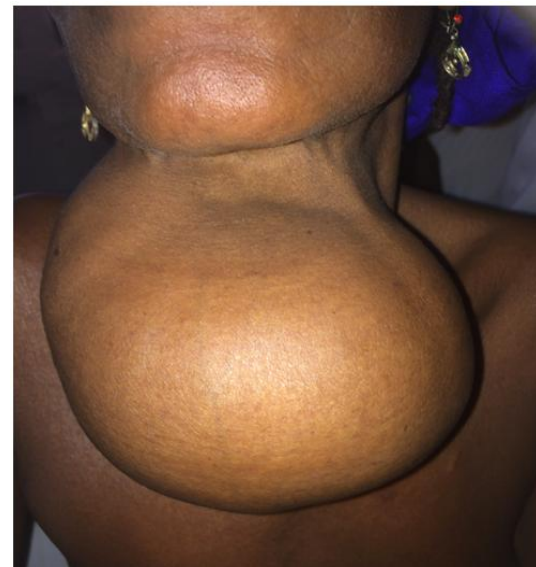


Fig. 2. Giant goiter in a female patient

Table 1. Age and sex distribution of patients

S/No	Age (years)	Males	Females
1	0 – 20	-	-
2	21 – 40	-	2
3	41 – 60	4	7
4	61 – 80	2	4
5	Total	6 (31.6%)	13 (68.4%)

Table 2. Weight distribution of excised giant goiters

S/No	Weight (gram)	Frequency (%)
1	0 – 1000	4 (21.0)
2	1001 – 2000	9 (47.4)
3	2001 – 3000	5 (26.3)
4	3001 – 4000	1 (5.3)
5	Total	19 (100.0)



Fig. 3. Plain radiograph of the neck showing deviation and narrowing of the trachea (arrow) due to giant goiter

Table 3. Duration of goiter before presentation to the hospital

S/No	Duration (years)	Males	Females	Total (%)
1	0 – 10	1	2	3 (15.8)
2	11 – 20	4	9	13 (68.4)
3	21 – 30	1	1	2 (10.5)
4	31 – 40	-	1	1 (5.3)

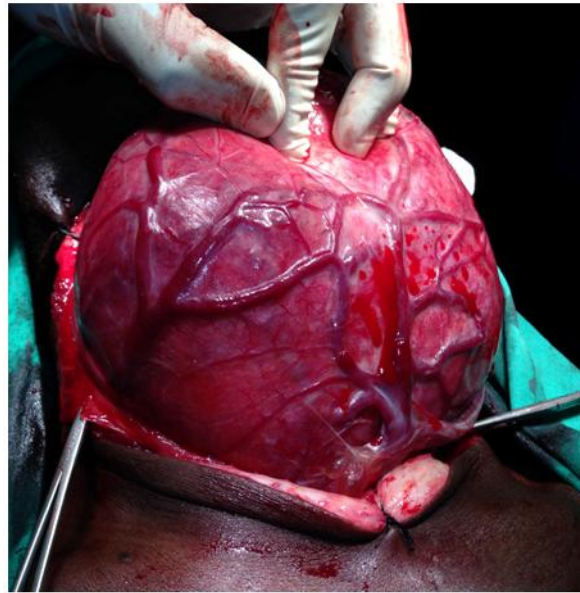


Fig. 4. Intraoperative giant goiter with prominent vessels being delivered via a transverse Collar Stud incision (Cervical incision)

The major preoperative complication was difficulty in breathing and tracheal deviation in all patients [Table 4] and is attributed to the compression caused by the giant size of the goiter. The risk factors observed were; tracheal deviation [Fig. 3], tracheomalacia, and retrosternal extension. Tracheal deviation was observed in all 19 (100%) patients, tracheomalacia in 8 (42.1%) patients,

and retrosternal extension in 7(36.8%) patients [Table 5]. Post operatively, 4 (21.1%) had temporary tracheostomy due to tracheomalacia, while 2(10.5%) had unilateral recurrent laryngeal nerve injury. No patient had postoperative haematoma. Histological analysis of the specimen showed benign thyroid lesion in all patients.

Table 4. Pre-operative and postoperative complications of giant goiter

Pre-Op complications	Number of patients
Difficulty in breathing	19
Trachea deviation	19
Hoarseness	8
Dysphagia to Solid diet	4
Post – operative complications	Number of patients
Tracheomalacia	8
Unilateral Recurrent Laryngeal nerve injury (transient)	2
Tracheal incision	2
Hypocalcaemia	2
Hypothyroidism	1

Table 5. Risk factors for respiratory complications observed

Risk factors	Number of patients
Tracheal deviation	19
Giant size goiter	19
Tracheomalacia	8
Retrosternal extention	7
Recurrent Laryngeal Nerve Injury	2

All patients had subtotal thyroidectomy through a cervical approach and a Redivac drains was inserted into the thyroid gland bed. No mortality was recorded. Average hospital stay was 10+/-2 days. Follow up period of averagely 12 months were uneventful.

4. DISCUSSION

A total of 97 patients were operated in the ENT department of our hospital over the study period. Otorhinolaryngologists in our hospital do not exclusively perform thyroid surgeries. The General surgeons also perform thyroid surgeries, so this number may not be representative of the total cases operated in the hospital. Although the study was conducted in the major tertiary referral hospital serving Sokoto, Kebbi, Zamfara, and parts of Niger states, other hospitals in the region also carry out thyroid surgeries. It will therefore be difficult to comment on the burden of the disease in the study area based on this data. The region where the hospital serves is endemic for goiter, and giant goiters are almost exclusive to endemic regions [7,17]. Syed and colleagues recorded a total number of 100 cases of surgically operated and histologically diagnosed goiters over 5 years in Abbottabad, Pakistan [16]. Agarwal and colleagues reported, 1350 cases of surgically excised goiters over a 14-year period, in a tertiary hospital [6].

Out of the 97 patients in this study, 19 had giant goiters. Various authors have attempted to define goiters that are unusually large in size giving it different names such as Giant, Huge or large goiters. Gyoh and Emery defined Giant goiters as that which protrudes beyond the chin or jaw [7]. This clinical definition makes it easy for surgeons to categorize their patients pre-operatively, for the purpose of intra-operative management and research. Malik and colleagues also adopted this definition [18]. Inability to palpate the cricoid cartilage has also been proposed as a definition by some authors [11]. Definitions based on weight and sizes though more objective are varied in literature, and there

appears to be no consensus on the threshold above which a goiter should be considered excessive in size. While Agarwal and colleagues consider goiters of > 400g to be huge, Machado and colleagues considered > 500g to be large goiters, while Gao and colleagues considered a goiter measuring 6 – 20cm to be giant [6,8,13]. This lack of consensus in size made us to adopt the clinical definition proposed by Gyoh and Emery. Gyoh and Emery reported 200 cases of giant goiters over a 4-year period in a tertiary hospital in Northern Nigeria [7]. At the time Gyoh and Emery conducted their study, Universal salt iodization was not enforced in Nigeria, and as such iodine deficiency could have been responsible for the large number of patients [19]. Their study was also conducted in a tertiary hospital that was serving a large population, due to the lack of widespread specialist care in the country at that time. The large number of patients with giant goiters in their study is therefore not unexpected. Studies in other parts of the world observed fewer patients with giant goiters, similar to the findings observed in this study [6,13,18].

Goiters are common in the third and fourth decade of life because of increase metabolic activity for various reasons [4]. The most common cause of goiter worldwide is iodine deficiency and reports showed an estimate of 200million of the 800million people who have a diet deficient of iodine are affected with goiter [4]. In fact iodine deficiency disorder is found to be associated with the presence of endemic goiters in most parts of the world. Patients with giant goiters are not too different from other patients with non-giant goiters, except that they present late to the hospital. They are usually observed to present at an older age than other goiter patients, with a higher mean age [6]. We observed a mean age of 53.2 years, with an age range of 39 to 71 years in this study. The age group 41 to 60 years was the most commonly observed age group among our patients. The patients in our study had a mean age that

was at least 10 years older than those in other studies conducted within Africa not classified as giant goiters [4,14,15,20]. Gyoh and Emery however observed that majority of their patients were in the 15 to 45 year group [7]. This is in contrast to the findings in our study. Females are more affected by diseases of the thyroid due to increase metabolism that is associated with pregnancy, lactation and menstruation [7,13,15,16,21,22]. Thirteen (68.4%) of patients with giant goiters in this study were females.

We observed that patients were reluctant to present early to the hospital for treatment. Most patients presented between 11 to 20 years, with a patient presenting with goiter weighing 3.2 kg. Among the 200 patients reported by Gyoh and Emery, 72 had goiters for more than 20 years, while 12 had goiters for more than 30 years [7]. Those authors that did not classify their goiters as being huge or giant had lower mean duration of symptoms before presenting to the hospital [14,15]. Most authors were not specific on the weight of the excised thyroid tissue, but Malik and colleagues working on patients in a district hospital in Pakistan reported weights ranging from 650 g to 1800 g [18]. Machado and colleagues reported weights of 824g and 640g [8]. Cosmesis is the commonest reason patients with simple goiters seek treatment [15,16,18,23]. Others are respiratory problems and compressive symptoms. In this study all our patients presented to the hospital because of respiratory complications not necessary for cosmesis. This may be attributed to the fact that Access to healthcare is difficult and expensive and patients may have to travel long distances of over hundreds of kilometers to access a tertiary health center. Secondly, the peculiar cultural dressing in this environment where women cover their bodies including their necks, may be responsible for the reluctance to seek medical care on grounds of cosmesis.

Respiratory problems are a significant cause of morbidity and mortality among patients with goiter [5,10,11,24,25]. Eight of our patients had tracheomalacia, four of them had temporary tracheostomy, and were successful decannulated. Poor tracheostomy tube care itself can be a cause of mortality in these patients [10]. There is need to carefully select and manage patients with huge goiters in a hospital that will provide the facilities needed to address any

emergency that may arise. Where the primary surgeon is not an ENT surgeon, there is need to collaborate with ENT surgeons, in anticipation of possible post-operative complications that may arise from these giant goiters. Our patients had subtotal thyroidectomy (Fig. 4). The few patients with retrosternal goiters had it excised via a transverse Collar Stud incision (Cervical Incision). None of our patient had sternotomy. Agarwal and Aggarwal in a systematic review reported level II – IV evidence that subtotal thyroidectomy results in recurrence in 50% of patients, and complication rates of total and subtotal thyroidectomy are not different [12]. We did not observe any recurrence among our patients. Other authors also offered subtotal thyroidectomy to their patients [13,15,26].

5. LIMITATION OF THIS STUDY

The small sample size in our study may not represent the actual prevalence in our environment. Also records of those performed by the General surgeons and from other peripheral hospital in the region were not included in the study.

6. CONCLUSION

Giant goiters are not uncommon in endemic areas. We observed 19 cases of giant goiters out of the 97 patients who were operated for goiters. The commonest cause of presentation was respiratory obstruction, and most of them stayed for 11 to 20 years at home before coming to the hospital to seek medical care. All patients had subtotal thyroidectomy with no case of recurrence. There is need to enlighten people, especially those in rural areas on the need to present early for treatment, and to make deliberate efforts to subsidize healthcare for them.

CONSENT AND ETHICAL APPROVAL

As per university standard guideline, participant consent and ethical approval have been collected and preserved by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Williams N, O'Connell P, McCaskie A. Bailey and Love's Short Practice of Surgery, 25th Edition. Milton: Chapman and Hall/CRC. 2008;771-806.
2. Moalem J, Suh I, Duh Q. Treatment and Prevention of Recurrence of Multinodular Goiter: An Evidence-based Review of the Literature. *World Journal of Surgery*. 2008; 32(7):1301-1312.
3. Farling PA. Thyroid disease. *British Journal of Anaesthesia*. 2000;85(1):15–28.
4. Ogbera A, Kuku S. Epidemiology of thyroid diseases in Africa. *Indian Journal of Endocrinology and Metabolism*. 2011; 15(6): 82.
5. Ket S. Acute respiratory failure and tracheal obstruction in patients with posterior giant mediastinal (intrathoracic) goiter. *Interactive Cardiovascular and Thoracic Surgery*. 2004;3(1):174-175.
6. Agarwal A, Agarwal S, Tewari P, Gupta S, Chand G, Mishra A, et al. Clinicopathological Profile, Airway Management, and Outcome in Huge Multinodular Goiters: An Institutional Experience from an Endemic Goiter Region. *World Journal of Surgery*. 2012; 36(4):755-760.
7. Gyoh SK, Emery JG. Coping with respiratory obstruction after thyroidectomy for giant goiters in northern Nigeria. *Ann R Coll Surg Engl*. 1988;70:99–104
8. Machado N. Thyroidectomy for Massive Goiter Weighing more than 500 Grams. Technical Difficulties, Complications and Management. *Review. Surgical Science*. 2011;02(05):278-284.
9. Gardiner KR, Russell CF. Thyroidectomy for large multinodular colloid goiter. *Journal of the Royal College of Surgeons of Edinburgh*. 1995;40(6):367-370.
10. Nada A, Mohamed Ahmed A, Vilallonga R, Armengol M, Moustafa I. A giant euthyroid endemic multinodular goiter with no obstructive or compressive symptoms. *Case Reports in Medicine*. 2011;2011:1- 3.
11. Mallat J, Robin E, Pironkov A, Lebuffe G, Tavernier B. Goiter and difficulty of tracheal intubation. *Annales Françaises d'Anesthésie et de Réanimation*. 2010; 29(6):436-439.
12. Agarwal G, Aggarwal V. Is total thyroidectomy the surgical procedure of choice for benign multinodular goiter? An evidence-based review. *World Journal of Surgery*. 2008;32(7):1313-1324.
13. Gao B, Tian W, Jiang Y, Zhang X, Zhao J, Zhang S et al. Peri-Operative Treatment of Giant Nodular Goiter. *International Journal of Medical Sciences*. 2012;9(9):778-785.
14. Dodiya-Manuel A, Dodiya-Manuel ST. Spectrum of thyroid diseases in the surgical department of a tertiary center in South-South, Nigeria. *Niger Health J*. 2016;16(2):19-27.
15. Abede B, Osman M. Goitre in a teaching hospital in the northwestern Ethiopia. *East and Central Afr J Surg*. 2006;11:21-27
16. Akbar SA, Ahmed N, Ali J, Qasim M, Khan Z, Afridi NM. Multinodular goiter: frequency of malignancy and its histological types. A tertiary care hospital experience. *Professional Medical Journal*. 2010;17(1): 40–43.
17. Wilson D. Goitre in ceylon and Nigeria. *British Journal of Nutrition*. 1954;8(2):90-99.
18. Malik AZ, Latif S, Anwer I, Syed R, Alvi I. Giant multinodular goiters: Surgical experiences in Northern Pakistan. *Journal of Surgery Pakistan (International)*. 1999; 4(3):25 -27.
19. Moyib OK. Iodine content of branded iodized Nigerian table salt: Ten years after USI Certification. *Nigerian Journal of Chemical Research*. 2018;23(1): 10– 20.
20. Solomon R, Iliyasu Y, Mohammed AZ. Histopathological pattern of thyroid lesions in Kano, Nigeria: A 10 year retrospective review (2002-2011). *Niger J Basic Clin Sci*. 2015;12:55-60.
21. Isichei UP, Morimoto I, Das SC, Egbuta JO, Banwo AI, Nagataki S. Endemic goiter in the Jos Plateau region of Northern Nigeria. *Endocrine Journal*. 1995; 42 (1): 23 – 29.
22. Sarfo-Kantanka O, Kyei I, Sarfo F, Ansah E. Thyroid Disorders in Central Ghana: The Influence of 20 Years of Iodization. *Journal of Thyroid Research*. 2017:1-8.
23. Rahman GA, Kolawole IK. Cervical plexus block for thyroidectomy: Experience with a giant goiter: A case report. *Nigerian*

- Journal of Clinical practice. 2008;11(2): 158–161.
24. Gutierrez T, Leong A, Pang L, Chevetton E, Jeannon J, Simo R. Multinodular thyroid goitre causing obstructive sleep apnoea syndrome. The Journal of Laryngology & Otology. 2011; 126(2):190-195.
25. De Felice A, Fuschillo S, Martucci M, De Angelis E, Balzano G. Euthyroid goitre and sleep apnea. Monaldi Archives for Chest Disease. 2016; 65(1).
26. Abdullahi K, Abdullahi M. Fine needle aspiration cytology of the thyroid gland in Sokoto, Nigeria: A 5 years' Experience. Ann Trop Pathol. 2017;8:17-9.

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