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Subtotal Thyroidectomy under Local Anesthesia in a Pregnant Woman Presenting with Giant Goiter: A Case Study

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Authors' contributions

This work was carried out in collaboration between all authors. Author BE designed the study and performed the surgical operation. Authors BAO, AOO and MTM developed the draft of the manuscript. Authors VIU, EOU and MO wrote the protocol. Authors PA and ME wrote the first draft of the manuscript. Authors CNA and PDA managed the literature searches. All authors read and approved the final manuscript.

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Case Study

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ABSTRACT

Thyroid surgery is performed by most surgeons in practice using general anesthesia. In resource poor developing nations with paucity of anesthetists, anesthetic drugs and equipment, it can be done under local anesthesia with acceptable results. We report a case of a 17 week pregnant woman who presented with giant goiter and respiratory obstructive symptoms. Post-op, she carried the pregnancy to term with safe delivery. She was followed up for two years with no morbidity recorded. Thyroidectomy using local anesthesia is safe and cost effective and applicable to a wide range of patients, including those who pose a general anesthetic risk.

Keywords: Giant goiter; subtotal thyroidectomy; local anesthesia.

1. INTRODUCTION

The incidence of thyroid disease is increasing, predominantly among women [1]. An estimated 15 percent of the general population has abnormalities of the anatomy on physical examination and an unknown percentage of these do not complete a diagnostic evaluation [2]. It has been suggested that the number of people affected may be twice as many as the undetected cases [3].

The adult thyroid gland comprises a bilobular structure weighing between 15 and 25 mg in the Caucasian and between 7-25mg in African [4]. Giant goiter is an enlargement of the thyroid gland not less than 10gm/kilogram body weight [5].

Pregnancy is the state of relative iodine deficiency secondary to an increase to renal loss and transfer of iodine to the developing fetus. In order to compensate, the thyroid gland increase its uptake of iodine from the blood and if this is lacking, cellular hyperplasia and goiter will result [6].

Thyroid disease is the second most common cause of endocrine dysfunction in women of child bearing age [6]. Thyroid disorders like hypothyroid 1% of pregnant women [6], with hyperthyroidism affecting 0.2% of pregnant women [7] and 95% of these will have a diagnosis of Graves' disease, an autoimmune disorder associated with circulating immunoglobulin (IgG) antibodies to the thyroid, TSA receptor, which stimulates thyroid hormones production. Thyroid nodules or solitary toxic nodules or adenomas are found in 2% of pregnant women [8] and usually present with hyperthyroidism.

The work up of a thyroid nodule discovered in pregnant patient is similar to that in the non-pregnant patient except for the fact that radionuclide scans are contraindicated [9]. In general, extensive laboratory testing is not helpful [10,11]. Mazzaferri [12,13], suggested that the level of thyroid stimulating hormone be obtained to identify suspected thyroiditis. Most patients with a malignant thyroid nodule have a normal finding on thyroid function testing.

Ultrasound is safe in pregnancy but does not diagnose or exclude malignancy [9]. Fine-needle aspiration is the most important diagnostic tool in the work-up of a thyroid nodule discovered in pregnant patient [9].

Therapeutic modalities for managing thyroid disorders include use of thionamades, beta-blockers, iodides, radioactive iodine and surgery. In pregnancy, there is a need to strike a delicate balance having in mind the well-being of the developing fetus and that of the mother. The thyroid disorder on its own has a deleterious effect on the fetus.

Surgery as an option is reserved for patients with simple goiters, those with controlled toxic goiter, malignant cases and those with compressive symptoms from a large goiter. The timing of surgery for nodules discovered in pregnancy is controversial. Hamburger [14] recommends surgery if the findings of fine-needle aspiration are positive for cancer. In pregnant patients with differentiated thyroid cancer found after 20 weeks gestation, a definitive surgery is usually delayed until after delivery [9]. For cancer found early in pregnancy, surgery during the second trimester is safe for the patient and her fetus [10,15,16].

With these in mind, we report a case of a pregnant woman with giant goiter presenting with compressive respiratory symptoms at 17 week gestation and had a subtotal thyroidectomy done under local anesthesia.

2. CASE REPORT

A 35 year old $G^5P^4+^0$, 4 alive presented with a 2 years history of anterior neck swelling with associated 1 year history of neck pain with periodic cessation of breathing, also of 1 year duration. This was accompanied with difficulty in breathing. There was no history of dysphagia, no change in voice, no loss of weight. Physical examination revealed an acutely ill looking woman in severe respiratory distress with a respiratory rate of 32 cycles per minute, associated with flaring of alae-nasi and sweating. Neck examination showed a multinodular goiter involving the two lobes of the thyroid gland and the isthmus. All other examinations were essentially normal. An assessment of simple goiter with respiratory obstruction in pregnancy was made. Investigation done included Packed Cell Volume (35%), fasting blood sugar (4.5 mmol/l. Normal=3.6-5 mmol/l). Two units of blood were cross matched.

After obtaining informed consent, patient was prepared for surgery. She had an intravenous infusion in place. On the operating table, she was put in supine position with sandbag under the shoulder and neck extended on a head ring. Local anesthesia was given with 20 mls of 2% xylocaine double diluted with equal volume of water for injections and infiltration along the line of incision. This was done repeatedly as the surgery progressed. Maximum volume of anesthesia used was 40 mls of now 1% plain xylocaine.Usually we have an anesthetist with us during the procedure. If local anesthesia is not satisfactory, he gives some sedation like pentazocine or diazepam. If local anesthesia with sedation fails, he proceeds to administer general anesthesia. He also monitors the patience's vital signs during the procedure.

The incision was deepened to the investing layer of deep cervical fascia with upper and lower flaps raised. The investing layer incised longitudinally to expose the strap muscles which were retracted along their fibers. The pretrachealfascia was incised to expose the thyroid gland which was mobilized completely from its bed. The inferior thyroid arteries were tied in continuity. The superior thyroid arteries were also ligated. Thyroid gland was excised living about $^1/_8{}^{th}$ of the original size. Hemostasis was secured and drain inserted into the empty bed of the thyroid gland. Few stitches were applied to the strap muscles. The skin was closed with subcuticular stitches using nylon 1. Due to the fact that patient was talking throughout the case; the recurrent laryngeal nerves were not sought but carefully avoided using knowledge of its anatomy.

Immediate post up condition was satisfactory with an estimated blood loss of 350 mls. Intramuscular diclofenac was given followed by paracetamol tablet for one week. No blood was transfused. The duration of the operation was $2^{1}/_{2}$ hours, patient did well after the surgery and was discharged on the 3rd day. She carried the pregnancy to term, delivered safely and was followed up for 2 years without any problem. Surgical pathology of the mass weighing 600 gm was colloid goiter. Fig. 1 shows the patient pre-op.

Fig. 1. The view of patient's neck before surgery

3. DISCUSSION

The first documented partial thyroidectomy was carried out by a Frenchman, Pierre Joseph Desault in 1791 [17]. Earlier methods practiced by a Moorish physician, Albucasis in about 952AD in Zahra,an Arab city of Spain led to extirpation of the gland [5,17].

Thyroidectomy is usually performed under general anesthesia endotracheal intubation.

Such facilities and personnel are usually not readily available in most developing countries. Surgical care is insufficient or non-existent in many regions of the world and the lack of access to surgical care accounts for a high number of disability adjusted life years (DALY), defined as years of healthy, life lost [18]. WHO estimates that 2 billion people have no access to basic surgical care and that surgery could be used to cure 11% of the global burden of disease [19].

Local and regional anesthesia for thyroidectomy has become common practice and has been reported by a number of authors [5,20,21,22,23]. However, our extensive review of the literature found no report of giant goiter operated under strict local anesthesia without ketamine in a pregnant woman and to our knowledge this is first case reported.

Surgery for thyroid diseases is reserved for failure of the standard management and or in those with significant goiter causing stridor, respiratory distress, dysphagia or carcinoma [6]. The index patient presented with respiratory distress.

Thyroid surgery is associated with high incidence of hypothyroidism postoperatively. Other postoperative complications include hypopara-thyroidism (1-2%) causing hypocalcaemia and recurrent laryngeal nerve palsy (1-2%) [6]. We did not bother to sought for either of the recurrent laryngeal nerves as the patient talked with us thought the operation and helped prevent issue of recurrent laryngeal nerve palsy. In case of slipped ligature of superior pedicle during the procedure, the pedicle is usually tied in continuity, the artery is not transected. This helps in preventing slippage of ligature, but in cases with slipped ligatures, application of pressure at the site and careful search for the pedicle and ligating it once located will suffix. Surgical and anesthetics morbidity and mortality are also increased in pregnancy. In pregnant patients presenting with goiter, airways can be difficult because of accompanying pregnancy induced changes like generalized weight gain, increase in breast size, respiratory mucosal edema and increased risk of pulmonary aspirations. Hemodynamic responses to laryngoscopy can be exaggerated and detrimental. Inadequate depth during the general anesthesia can lead to hypertensive crisis and dysrhythmias which can cause considerable morbidity [7].

The reported pregnancy loss associated with general anesthesia and surgery of all types is approximately 8% and decrease to 6.5% in the second trimester [6]. The patient presented at 17 weeks gestation and carried the pregnancy to term. She was followed up for up to 2 years post-up with no morbidity recorded.

The patient was minimally investigated, requesting for essential investigations and stayed three days in the hospital after the surgery. This was a safe and cost effective procedure in a resource poor environment when compared to the cost, complications associated with and availability of complex general anesthesia for same procedure in other clime.

4. CONCLUSION

Subtotal thyroidectomy for giant goiter can be done under strict local anesthesia without recourse to use of ketamine in a pregnant woman. It is not only safe but it is cost effective for pregnant patients undergoing thyroid surgery when compared to general anesthesia. Surgeons in training in developing countries should be encouraged to have adequate exposure and training in local anesthesia, as it will help to avoid a situation where surgeons in peripheral hospitals are not able to perform thyroidectomy and patients made to live with the social stigma if the patient cannot afford the expenses of travelling to a teaching hospital. It is simple safe, acceptable and cost effective in our experience.

ETHICAL CLEARANCE

Ethical clearance certificate for this study was obtained from Benue State University Teaching Hospital with ref. no:
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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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