International Journal of Medical and Health Research
ISSN: 2454-9142
www.medicalsciencejournal.com
Volume 1; Issue 5; December 2016; Page No. 43-48

Management of recurrent goiter; the challenges and achievements

[1] Mohamed Nagi, [2] Saad Altaleb, [3] Intekhab Alam

[1, 2] Faculty of medicine, University of Benghazi, Benghazi, Libya
[3] Alhawari general hospital, Benghazi, Libya

Abstract
Background: one of the major challenges of the surgical management of goiter remains the assessment as to which goiter will develop recurrence and which will not develop recurrence after conservative surgery. Since surgery of the goiter has been greatly influenced by Theodor Kocher all over the world, the traditional conservative Kocher type of surgical resection of the goiter showed to harbor the problem of a high recurrence rate after conservative surgery (mentioned in many of the literatures as high as 2 to 70%).
Objective: To determine the different factors responsible for the recurrence of goiter, and to verify and discuss the difference between conservative and radical surgery of goiter in regard this challenge.
Results: The total number of cases were 1350, 115 males and 1195 females, the age range from 19 to 72 years old, all of the cases presented with goiter and operated with different procedures, there was 42 cases presented with recurrence after follow up for 1 to 10 years (recurrence rate 3.1%). all the recurrence cases were reoperated and their morbidity were compared to the group which not develop recurrence.
Conclusion: surgery of goiter is one of the common surgical procedures performed in our hospitals. Experience hands is needed to reduce the recurrence rate of this disease. Our experience confirms the results of a review of literature on this topic: the best management of recurrent goiter is its prevention by primary total thyroidectomy.

Keywords: recurrent goiter, total thyroidectomy, postoperative complications

1. Introduction

One of the major challenges of the surgical management of goiter remains the assessment as to which goiter will develop recurrence after conservative surgery. Since surgery of the goiter has been greatly influenced by Theodor Kocher all over the world, the traditional conservative Kocher type of surgical resection of the goiter showed to harbour the problem of a high recurrence rate. When Theodor Kocher, former Chairman of the Department of Surgery at the University of Bern, Switzerland, introduced his standards of thyroid surgery based on the physiologic understanding of thyroid disease, he not only became the mentor for thyroid surgery allover the world, but more importantly he was able to solve the devastating problem of iodine deficiency-induced goiter disease and cretinism in endemic regions. Some 80 years later, however, the incidence of recurrent goiter in our endemic region is still remarkable. (1)

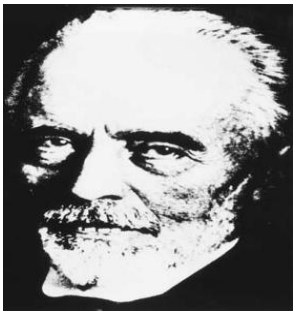

Fig 1: *Kocher is considered the father of thyroid surgery he won the Nobel Prize in medicine, in 1909, in recognition of his work on the thyroid gland.*

The recurrence rate after this type of surgical management is high and mentioned in many of the literatures as high as 2 to 70%.Worthwhile, the surgical treatment of such recurrence is associated with higher morbidity and mortality than a primary total thyroidectomy.Therefore, a great effort was carried out to modify the primary surgical management of goiter to reduce the recurrence rate.

2. Objectives

To determine the different factors responsible for the recurrence of goiter, and to verify and discuss the difference between conservative and radical surgery of goiter in regard to this issue.

2.1 Patients and Methods

A retrospective study in which the authors have analyzed their 20-years' experience with surgical treatment of 42 patients with recurrent goiter out of 1350 patients operated for goiter during the period from 1-1-1990 to 30-01-2010.
The history and physical examination are recorded, the preoperative preparation were studied and the operative, postoperative results were assessed and the recurrence rate were analyzed.

3. Results

The total number of cases was 1350,1195 females and 115 males The age range from 19 to 72 years,The main complaint for all of the cases was GOITER, and all cases are EUTHYROID (clinically and biochemically)when they are presented for surgery.

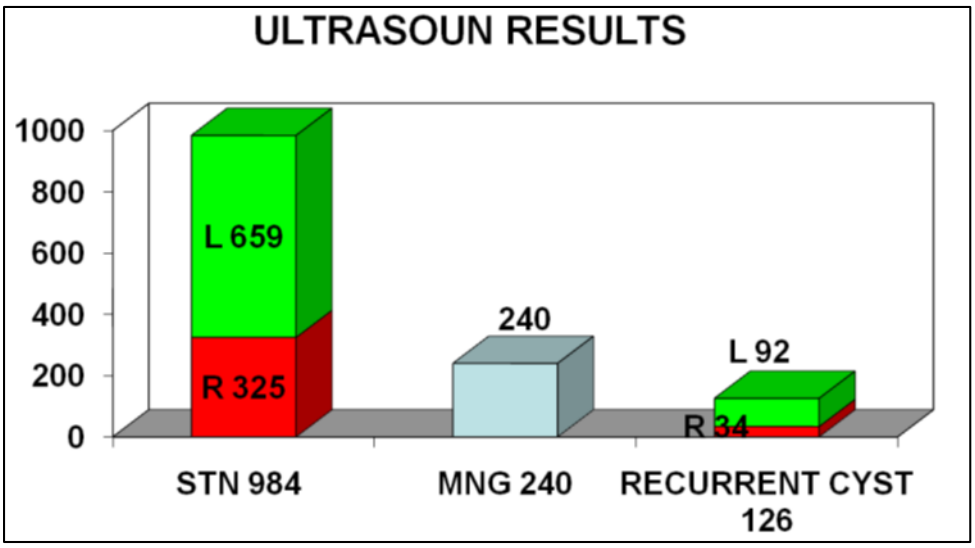

Fig 2: shows the preoperative ultrasound results

FNAC done for 801 patients (59 % of cases), it is done in all cystic cases and 675 of STN, not done for the remaining STN and all MNG. Results of FNAC shows, 70 cases malignant and 20 cases suspicious. In the intraoperative findings, Out of 984 of preoperative STN there was only 842 STN, the other 142 (14 %) found to be MNG and the was recurrent cystic goiter in 126 of cases after the previous aspiration by FNAC and 240.multinodular goiter. Intraoperative frozen sections and intraoperative ultrasound not done in our study. The decision for the type of the operation was depend upon intraoperative findings and the results of FNAC, For the STN the resuts of the postoperative histopathogy shows 173 malignant cases (20%) out of all STN cases (143 Papillary Carcinoma, 25 Follicular Carcinoma, 3 Anaplastic Carcinoma, and 2 Mixed tumor).in 97 case Total thyroidectomy were done in the first operation and 76 cases reoperated, total thyroidectomy was done, because the first operarion were lobectomy with or without isthmectomy. For the MNG the results of the postoperative histopathogy shows 42 malignant cases (11%) out of all MNG, and all of the cases werePapillary Carcinoma, in 40 case Total thyroidectomy were done in the first operation, 2 cases reoperated, total thyroidectomy done, because the first operation were subtotal thyroidectomy. the majority of the cases send for radioactive iodide therapy abroad.

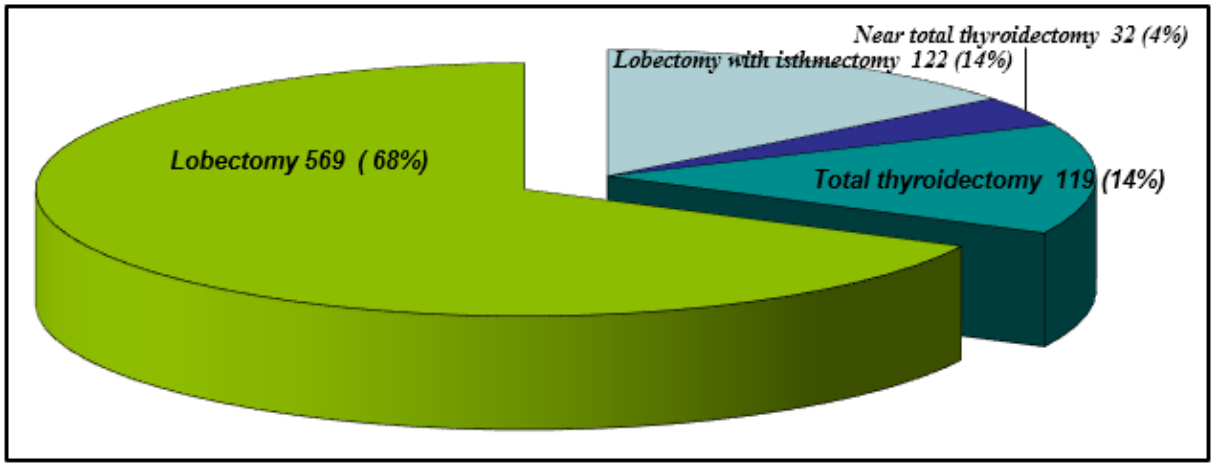

Fig 3: shows the type of surgery for STN in primary operation

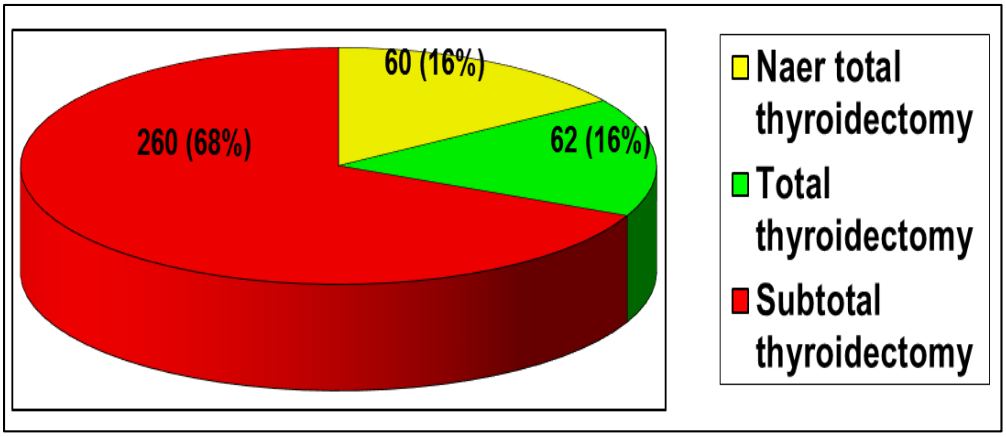

Fig 4: shows the type of surgery for MNG in the primary operation

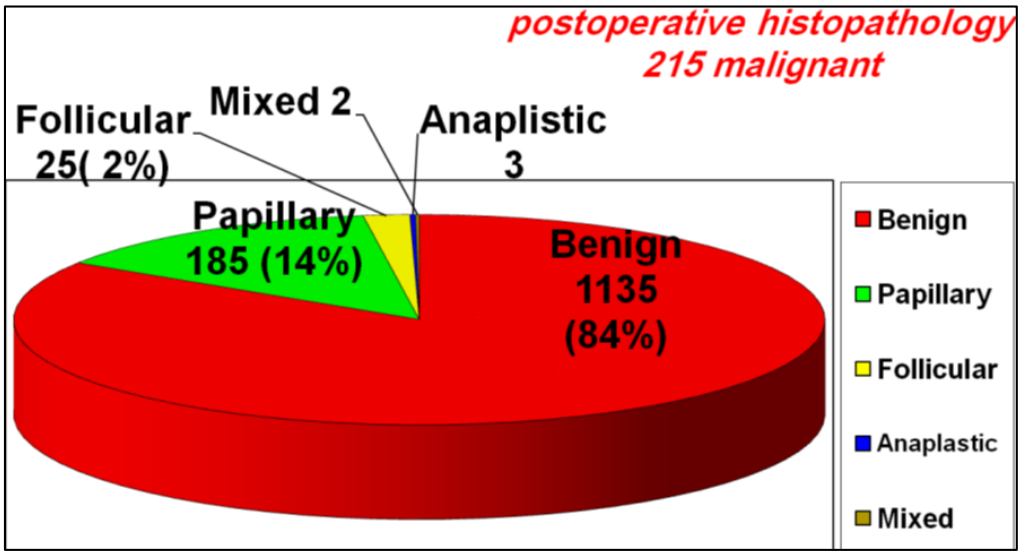

Fig 5: shows the postoperative histopathology in the primary operation

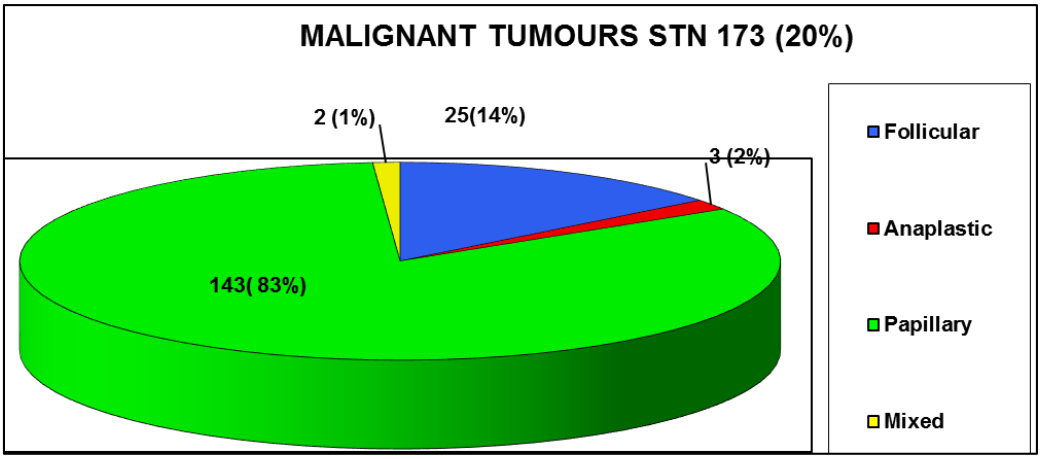

Fig 6: shows the distribution of malignant tumours in the STN in the primary operation

In the first operation there was no major or significant operative or early Postoperative complications and no mortality however there was minor postoperative including wound complications in 18 cases, Bleeding in 7 cases, Temporal hypocalciemia in 2 cases and Severe postoperative bleeding develops in 3 cases and these cases were exposed to reoperation to control the bleeding in the operation theater, with blood transfusion of 3 – 5 units. After follow up for 1 to 10 years, the total recurrence rate was 42 case (3.1 %). Out of 842 case of the STN the recurrence cases was 20 case (2.3 %) and out of 382 case of the MNG the recurrence cases was 22 case (5.6 %) and out of 126 case of the cystic cases there was no recurrence.

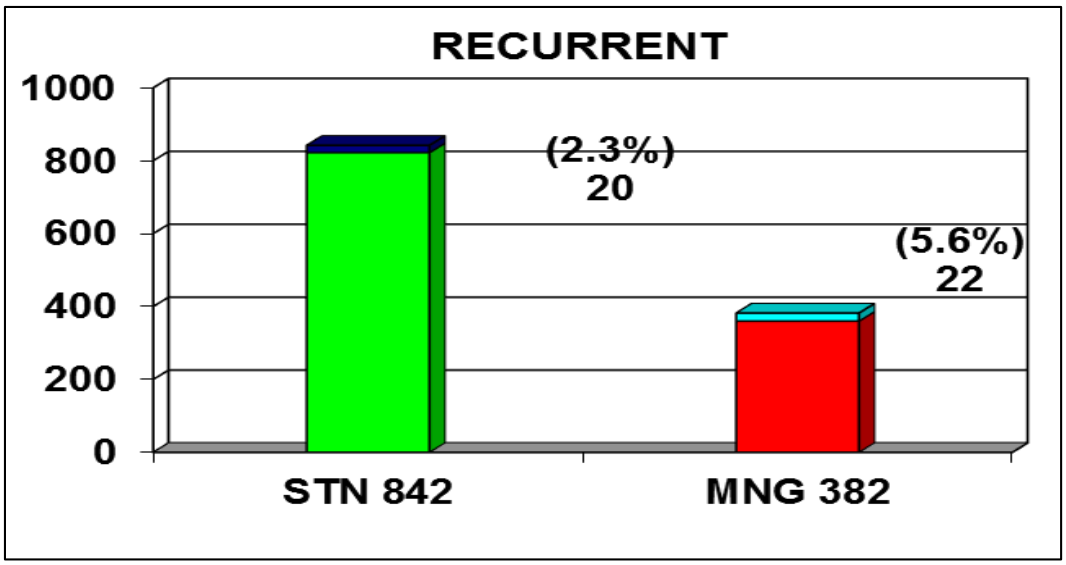

Fig 7: shows the recurrent rate in STN and MNG in the primary operation

All recurrent goiters were re-evaluated, proper history was taken, through physical examination was done and all cases underwent specific investigations (Ultrasound, FNAC and TFT). There was 5 cases of papillary carcinoma in the 20 recurrence cases of the STN and one case of papillary carcinoma in the 22 recurrence cases of the MNG and other cases of recurrence was benign. For the STN the type of the first operation in the recurrence cases was lobectomy only in 17 case and lobectomy with isthmectomy in 3 cases. For the MNG the type of the first operation in the recurrence cases was Subtotal thyroidectomy. All cases reoperated, Total thyroidectomy was done for all cases. the Postoperative major complications in the second operation was,Unilateral laryngeal nerve injury in 3 cases, Temporal hypocalcaemia in 4 cases and, Postoperative bleeding 3 cases. Postoperative histopathology shows 5 cases papillary carcinoma in the STN, and one case papillary carcinoma in the MNG which is the same result of the preoperative FNAC.

4. Discussion

Thyroid gland diseases represent significant number of cases admitted to the surgical department in our hospitals therefore they represent the main bulk of the surgical procedures performed in these hospitals. Currently there is different options available for the dialing with this diseases, starting at the endocrinologist and ending to major surgical procedures at the surgical department. Whatever the method, the aim of physician or surgeon is to relieve the patient's complaint and in the same time to reduce the morbidity (including the recurrence rate) as well as the mortality rates during the management of goiter. The proper management include history taken, through physical examination and relevant or specific investigations. Although Ultrasound neck was very accurate for cystic lesions in our study as well as in other literatures. it may miss other pathology in the other lobe in case of solitary thyroid nodule (STN), therefore experienced radiologist is needed for the right diagnosis. Recent study shows that Ultrasound neck is the basic visualization modality for thyroid diseases and is sufficient in 95.4% patients. In case of doubtful Ultrasound data, sub sternal goiter, for thyroid residue condition assessment in recurrent goiter, evaluation of thyroid carcinoma invasion and mediastinal lymph nodes metastases MRT is indicated. For functional autonomy assessment scintigraphy is indicated [2]. The radiologist needs to be aware of a potential pitfall that can influence the imaging appearance of thyroid goiter. Whether the patient is imaged with the arms overhead or by the side may affect the apparent mediastinal excursion of a goiter. CT scans obtained with the patient's arms by the side are more accurate for determining substernal extent of goiter than when the arms are overhead, a position usually used in chest CT. Ultimately, this difference in imaging technique may have a profound effect on the adjacent structures impacted by the goiter and may influence the planned surgical approach (3).Fine-needle aspiration cytology (FNAC) by experienced pathologist has become the diagnostic tool of choice for the initial evaluation especially for (STN). because of its accuracy, safety, and cost effectiveness. The primary operation for goiter should be performed promptly after its diagnosis because recurrence is faster especially in older people, and if the primary operation is non-radical the patients should be monitored for several years to diagnose recurrence as early as possible [4]**.** Obviously, the primary treatment of goiter depend up on the nature and character for that particular goiter, for almost all of malignant and highly suspicious cases the main procedure is radical surgery by total or near total thyroidectomy. However the main challenge remain for the treatment of benign goiter whether simple, toxic, (STN) or multinodular goiter (MNG). Recurrent goiter may occur because of the development of new nodules (true recurrence) or because of the growth of "residual" or persistent macroscopic or microscopic nodules left at the previous thyroid operation [5]. Worthwhile the incidence of carcinoma is high, in the solitary cold nodule was 17%, and in the clinically evident multinodular goiters, the incidence of carcinoma was 13%. Even though the difference is not significant. It is of interest that male patients with multinodular goiters had the highest incidence of carcinoma at 29%, whereas, males with a solitary cold nodule had an incidence of only 13% [6].obviously the recurrence rate is common in these types of goiter as mentioned in many literatures when the primary surgical procedure is not total or near total thyroidectomy, therefore careful decision should be taken to prevent the recurrence

rate.The recurrence rates is high when residual part of the thyroid tissue is left behind and it is reported in many literatures as high as 42 to 45 % following subtotal thyroidectomy for benign multinodular goiter [7].In other studies the recurrence rate of multinodular goiter varies between 8.9% and 40% [8]. With less radical surgery during the initial operation by near total thyroidectomy and adequate removal of all palpable nodules the incidence of recurrent goiter is safely reduced [9]. total thyroidectomy is a safe and effective alternate for the treatment of bilateral benign multinodular goiter [7]. This procedure prevents the future need of surgery for recurrence and remove the risk of incidental thyroid cancer. Intraoperative exploration of the other lobe in case of (STN) is mandatory when lobectomy is decided to exclude another pathology and intraoperative evaluation is the most important point for the proper surgical management of goiter [10]**.** The use of total thyroidectomy in thyroid cancer treatment is not unanimous, and it is even more controversial when this procedure is advocated for benign diseases On the other hand, the complication risk may have an increase up to 20 times in repeat operations for recurrence. Total thyroidectomy is the treatment of choice for multinodular goiter and thyroiditis, when there is bilateral gland involvement posterior to middle thyroid veins [9]. In endocrine surgery units, TT can be performed for MG with a definitive complication rate of around 1%; the main independent risk factors for the development of complications are hyperthyroidism and goiter size [11].One of the serious operative complication of total thyroidectomy especially for patients with recurrence goiter is injury to the recurrent laryngeal nerve (RLN) and to avoid this complication direct or indirect intra-operative stimulation of the recurrent laryngeal nerve can be done. For intra-operative neuromonitoring (IONM), indirect stimulation of the (RLN) is superior to direct stimulation. An intact acoustic (IONM) signal is highly predictive of intact postoperative (RLN) function. When the (IONM) signal is abnormal or absent, a one-stage extensive thyroid resection should be performed only if the surgeon is absolutely convinced that the first (RLN) is not harmed [12]. In highly suspicious cases Intraoperative frozen sections some time needed however it is use as routine is controversial. Thyroid nodules are very common, and although the majority are benign, approximately 5% may harbor malignancy [13]. The FDG uptake as measured by positron emission tomography (PET) scanning successfully discriminated between all benign and malignant tumors. This technique appears useful in the evaluation of thyroid nodules [14]. some studies suggests non-radical surgery for small carcinomas of the thyroid gland when there is no gross nodal metastases and in this cases long-term follow-up is mandatory [15]. non-radical surgery can be indicated in (MNG) also and the prevention of residual nodules is probably best assured with systematic palpation of the two thyroid lobes during operation and or intraoperative ultrasound. This considerably lessens the risk of recurrence practically in (MNG) otherwise total thyroidectomy is an appropriate operation for the management of diffuse multinodular goiter where the entire gland is involved because it precludes patients from the risk of reoperation [16]. most of the studies recommended total thyroidectomy because it is safe and effective treatment especially for bilateral benign multinodular goiter, and it is now the routine procedure throughout Australia and New Zealand. Its use has corresponded to a reduction in the need for secondary thyroidectomy for recurrent goiter [17, 18], The results of laser-induced interstitial thermotherapy (LITT) in the treatment of recurrent goiter is controversy. In one of the study, this investigation proved to be effective and safe method of nodular goiter treatment [19]. However The efficiency of application of (LITT) to the neoplasm treatment requires further study.

5. Conclusions

Surgery of goiter is one of the common surgical procedures performed in our hospitals. Therefore specialized center is needed to prevent or at least reduce the recurrence rate of this disease. Secondary thyroidectomy for recurrent goiter initially increased over the years (with a lag period of 13 years) [20], *our experience confirms the results of a review of literature on this topic:* the *best management of recurrent goiter is its prevention by radical surgery*.However, the indications for reoperation for recurrence cases when non-radical surgery is performed, it should be strict, and when unavoidable a modified approach may be helpful with specialized procedure for each individual case and preferably by experienced surgeon. Extensive resection of nodular tissue during the initial operation safely reduces the incidence of recurrent goiter and
subsequently reduces the rate of reoperation and eliminates the high risk of morbidity associated with reoperative thyroid surgery [21]. More surgical training and provision of intensive postoperative care facilities must precede adoption of more radical approach for benign lesions as recommended elsewhere [22]. routine postoperative prophylactic thyroxin therapy for 9 to 12
months in patients who have had an operation for benign nodular goiter has clinical value [10, 23, 24, 25].*with all our ACHIEVEMENTS* in the management of goiter, The major CHALLENGE of recurrence still present in some cases, particularly in benign thyroid diseases when non-radical surgery is performed, therefore further studies is need in regard to this issue.

6. References

1. Thyroid Gland Surgery in an Endemic Region :Christian A. Seiler, Christine Glaser, Hans E. Wagner, Department of Visceral and Transplantation Surgery, University of Bern, Inselspital, CH-3010 Bern, Switzerland, World J. Surg. 1996; 20:593-597.
2. US vs. MRI. Scintigraphy in Thyroid Diseases : 12th World Congress of the World Federation for Ultrasound in Medicine and Biology Convention & Exhibition Centre, Sydney, Australia.
3. Preoperative Imaging of Thyroid Goiter: How Imaging Technique Can Influence Anatomic Appearance and Create a Potentialfor Inaccurate Interpretation:Derek B. Pollard, Colin W. Weber, and Patricia A. Hudgins, AJNR Am J Neuroradiol. 2005; 26:1215-1217.
4. Janusz Pichurski, Jerzy Rudnicki, Maciej Sebastian, Anil K. Agrawal The Causes of Formation and the Surgical Treatment of Recurrent Goiter, Adv Clin Exp Med. 2009; 18(6):595-599.
5. Kraimps JL, Marechaud R, Gineste D, Fieuzal S, Metaye T, Carretier M, et al Analysis and prevention of recurrent goiter: Department of Surgery, Jean Bernard Hospital, Poitiers University, France. Surg Gtnecol. Journal. 1993; 176(4):319-22.

6. McCall A, Jarosz H, Lawrence AM, Paloyan E. The incidence of thyroid carcinoma in solitary cold nodules and in multinodular goiters.
7. Salman Yousuf Guraya FRCS, Abdu Hassan Al-Zobydi. Total and Near-total Thyroidectomy is Better ThanSubtotal Thyroidecomy for the Treatment of Bilateral Bening Multinodular Goiter; A Prospective Analysis: The Department of Surgery, College of Medicine, Taibah University, Ministry of Higher Education, PO Box 30054, Al Madina Al Munawara, Kingdom of Saudi Arabia Available online 28th, 2011.
8. Histopathological evaluation of recurrent goiter: Laryngoscope. 2003; 113(10):1820-6.
9. Total thyroidectomy for benign thyroid disease: Friguglietti CU, Lin CS, Kulcsar MA.
10. Recurrent goiter is it preventable? J Surg Pak. 2007; 12(4):166-9.
11. Rı´os-Zambudio PhD, Jose´ Rodrı´guez PhD, Juan Riquelme MD, Teresa Soria PhD, Manuel Canteras, PhD, Pascual Parrilla, PhD. Prospective Study of Postoperative Complications After Total Thyroidectomy for Multinodular Goiters by Surgeons With Experience in Endocrine Surgery: Antonio Ann Surg. 2004; 240:18-25.
12. Oliver Thomusch, Carsten Sekulla, Andreas Machens, Hans-Jürgen Neumann, Wolfgang Timmermann, Henning Dralle. Validity of intra-operative neuromonitoring signals in thyroid surgery: Department of General, Visceral and Vascular Surgery, Martin Luther University of Halle-Wittenberg, Halle, Germany. o.thomusch@gmx.de
13. Rebecca S Bahn, Regina M. Approach to the patient with nontoxic multinodular goiter Castro Division of Endocrinology and Metabolism, Mayo Clinic, 200 First Street SW, Rochester, Minnesota. 55905, USA.
14. Bloom AD, Adler LP, Shuck JM. Determination of malignancy of thyroid nodules with positron emission tomography: Department of Surgery, University Hospitals of Cleveland, Case Western Reserve University School of Medicine, Ohio 44106.
15. Noguchi S, Yamashita H, Murakami N, Nakayama I, Toda M, Kawamoto H. Small carcinomas of the thyroid. A long-term follow-up of 867 patients: Noguchi Thyroid Clinic and Hospital Foundation, Oita, Japan.
16. Total thyroidectomy. The preferred option for multinodular goiter Leigh Delbridge, MD Ana I, Guinea, BSc (Psych); Tom S Reeve MD. Total Thyroidectomy for Bilateral Benign Multinodular Goiter: Effect of Changing Practice, Arch Surg. 1999; 134:1389-1393.
17. Salman Yousuf Guraya, Omer A, Faroug Eltinay. Total Thyroidectomy for Bilateral Benign Thyroid Disease: Safety Profile and Therapeutic Efficacy: Division of General Surgery, Department of Surgery, College of Medicine and King Khalid University Hospital,, Riyadh, Kingdom of Saudi Arabia, Kuwait Medical Journal 2007; 39(2):149-152.
18. Seliverstov OV, Privalov VA, Lappa AV, Demidov AK, Faizrakhmanov AB, Yarovoy NN et al. Laser-induced interstitial thermotherapy in treatment of recurrent nodular goiter and thyroid cancer : state medical academy; bChelyabinsk state institute of laser surgery; cChelyabinsk state university; dChelyabinsk municipal clinical hospital
19. Delbridge L, Guinea AI, Reeve TS. Total thyroidectomy for bilateral benign multinodular goiter: effect of changing practice: Department of Surgery, Royal North Shore Hospital, University of Sydney, Australia. leighd@med.usyd.edu.au.
20. El Bushra, Ahmed Doumi, Mohamed Ibrahim, Mohamed Awadalla, Musa Abakar, Mohamed Yousif Bakhiet. Thyroidectomy at El Obeid Hospital, Western Sudan The University Surgical Department, El Obeid Teaching Hospital, Faculty of Medicine & Health Sciences, University of Kordofan. Khartoum Medical Journal 2009; 02(01):158-161.
21. Prevention of Recurrences After Thyroidectomy in an Endemic Area With Prophylactic Levothyroxine Use :Tr. J of Medical Sciences. 1999; 29:273-277.
22. Iodide or L-Thyroxine to Prevent Recurrent Goiter in an Iodine-Deficient Area: Feldkamp J, MD, Seppel T MD, Becker A, MD, Klisch A, Schlaghecke R, MD, PhD, *et al.* Prospective Sonographic Study ; Department of Endocrinology, Heinrich-Heine-University, Moorenstrasse 5, D-40225 Du¨sseldorf, Germany, 2Department of Surgery, Heinrich-Heine-University, Moorenstrasse 5, D-40225 Du¨sseldorf, Germany, World J. Surg. 1997; 21:10-14,
23. Geerdsen JP, Frølund L. Recurrence of nontoxic goitre with and without postoperative thyroxine medication: Department of Endocrinology, Rigshospitalet, Copenhagen, Denmark Correspondence: Jan Pico Geerdsen, Rosenhaven 514, 2980 Kokkedal, Denmark. Copyright Blackwell Scientific Publications, 1984.