Background: Using immunohistochemical markers can facilitate the diagnosis in thyroid carcinoma.
Patients and methods: Since 2004 up to June 2007 we analysed mRNA-expression (Micro-array-analysis) in unfixed fresh thyroid tissue to uncover possible differences in different benign and malignant thyroid diseases like follicular adenoma, Graves disease and all kinds of thyroid carcinomas (Group A). Results were used for Immunohistochemical analysis in paraffin embedded tissue prospectivly (Group B) and retrospectivly (Group C).
Results: A] Fresh tissue-probes were drawn in 143 patients. Analysis of FTC tissue showed an up-regulation for quinolinate-phosphoribosyltransferase (QPRT) (n=12).
B] Immunohistochemical analysis in paraffin embedded tissue showed positive results for QPRT in follicular adenomas in 30%, in micro-invasive FTC in 60% and in grossly invasive FTC in 90% (n=47).
C] Theses results are about to be reproduced in 100 own historical cases of FTC, investigation is in progress.
Conclusion: QPRT is a possible new immunohistochemical marker in FTC. Possibly QPRT can be used as a presurgical marker in thyroid cytology in the future.

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INTRATHYROIDAL HEMATOPOIESIS—A RARE HISTOLOGICAL FINDING IN AN OTHERWISE HEALTHY PATIENT AND REVIEW OF THE LITERATURE

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Background: Multinodular goiter represents the most common thyroid disease in Europe. Regressive changes like hemorrhage, infarction or fibrosis are frequently observed, calcifications have also been detected. Extramedullary hematopoiesis has been described in almost every organ, especially in patients with hematologic diseases. However, true bone formation is uncommon and to date only two cases of metaplastic bone formation with extramedullary hematopoiesis in the thyroid have been reported in the literature.
Patients and methods: We present a case of total thyroidectomy due to multinodular goiter harboring an area of mature bone and hematopoiesis in an otherwise healthy female patient. Furthermore we reviewed and summarized for the first time all available cases from the literature.
Results: We report the third case of metaplastic bone formation with foci of hematopoietic tissue in the thyroid gland. All three patients were young females without any obvious stimulus for extramedullary hematopoiesis.
Conclusion: Isolated extramedullary hematopoiesis seems to be more frequent in the thyroid gland than metaplastic bone with hematopoiesis, particularly in older people with underlying hematologic disorders. It also represents an important differential diagnosis of anaplastic carcinoma of the thyroid, particularly in intra-operative frozen sections and needle biopsy.

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TOTAL THYROIDECTOMY—A SURGICAL STANDARD PROCEDURE FOR THERAPY OF GRAVES' DISEASE

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Background: Surgery is an important therapeutic option in the treatment of Graves' disease. Nevertheless it is still controversial whether the extent of resection correlates with the number of surgical complications and the success of the therapy. This study evaluates the preconditions that would justify total thyroidectomy as part of the primary therapy concept for Graves' Disease.
Patients and methods: The prospective study covered the period from October 2001 to May 2007 and assessed 155 patients who underwent partial (subtotal) or total thyroidectomy for Graves' Disease. Neuromonitoring and LigaSure® was adopted as part of the routine surgical treatment from April 2006.
Results: One hundred twenty-nine patients (83.2%) underwent total thyroidectomy, 26 patients (16.8%) were treated with partial (subtotal) thyroidectomy (remnant 2–4 ml). Pathology findings revealed Struma basedowificata in 153 cases(98.7%) and occult papillary thyroid cancer in two cases (1.3%). Forty patients (91%) underwent total thyroidectomy, only four patients (9%) were treated with partial (subtotal) thyroidectomy with routine use of Neuromonitoring and LigaSure®. 0.8% of cases showed permanent recurrent laryngeal nerve (RLN) palsy for total thyroidectomy (TT) and 0% for partial(subtotal) thyroidectomy (ST). 1.6% of cases showed permanent hypoparathyroidism for TT, 0% for ST, 20% of cases displayed temporary hypoparathyroidism for TT, 23% for ST. Routine use Neuromonitoring and LigaSure® reduced the risk of RLN palsy (0%) and hypoparathyroidism (temporary 10%, permanent 0%) in TT, with an additional reduction in the duration of the operation.
Conclusion: Total or near-total thyroidectomy is an effective and safe treatment for Graves' disease when performed by an experienced surgeon. The use of Neuromonitoring and LigaSure® is still routinely recommended as the treatment for Graves' Disease.

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SINGLE-DOSE STEROID BEFORE THYREOIDECTOMY IMPROVES NAUSEA, PAIN AND VOCAL FUNCTION

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Background: We evaluated, if preoperative, single-dose steroid application reduces nausea, pain and voice disturbances after thyroid surgery.
Patients and methods: Sixty patients (m=16, w=44) with median age 55 years (range 18–80) entered a two-arm, randomized, double-blinded, controlled study receiving either dexamethasone 8mg (D) (n=30) or NaCl 0.9% (C) (n=30) i/v 30 min before anaesthesia. At 6 timepoints (4–48 h) after the operation nausea (verbal response scale (0–3), use of antiemetic medication), pain (visual analogue scale (VAS), analgesic use) and vocal function was registered.
Results: Groups did not differ in demographics. Nausea and antiemetic use was significantly less in group D compared to C. Over 48 h the difference in nausea and vomiting was significant (p<0.001; ANOVA repeated measures). There was a significant reduction in antiemetic use, too (D=16.1%/C=28.1%) (p<0.009). Mean scores for pain during the first 48 h after operation were 17.5/25.1 in group D and C, respectively (p<0.001) with a reduction in total opioid requirement (p<0.001). Changes in voice mean frequency over a 48 h period after surgery was significantly less in the dexamethasone group than in the placebo group (p< 0.02). No potential steroid related complications occurred.
Conclusion: Preoperative single-dose steroid not only reduces postoperative nausea/vomiting and pain within 48 h after thyroid resection but decreases voice dysfunction, too.

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IN VITRO EVALUATION OF PROTEASOME INHIBITON BY BORTEZOMIB AS A NEW OPTION OF ANTIPROLIFERATIVE THERAPY IN ANAPLASTIC THYROID CANCER

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Background: Anaplastic thyroid cancer (ATC) is characterized by uncontrolled tumor cell proliferation. Because of failure of usual therapy, patients with undifferentiated thyroid cancer are in desperate need of new therapeutic strategies. Bortezomib is an inhibitor of the proteasome that has been approved for the treatment of multiple myeloma. The aim of this study was to evaluate the effect of Bortezomib alone and in combinations on anaplastic thyroid cancer cell lines as a possible new therapeutic option for ATC.
Patients and methods: Three anaplastic thyroid cancer cell lines (Hth74,C643,KAT4) were evaluated in vitro. The antiproliferative effect of Bortezomib (0.1–100 nM) alone, or in combination with valproic acid (0.125–4 mM) or AEE788, a dual tyrosine kinase inhibitor (TKI) of EGF-R/VEGF-R, (AEE788 4 μM) on thyroid cancer cell lines was quantified by MTT assay. The proapoptotic effect was asessed by flowcytometric analysis (FACS) after PI staining and cell cycle analysis. Single and combination therapy of compounds were analyzed.
Results: Administration of Bortezomib (B) and valproic acid (V) inhibited tumor cell numbers as follows: 92% inhibition in Hth74 (B) 87,5%(V), 98% in C643(B) 44%(V) and 98% in KAT4(B) 50%(V). The IC_{50} of Bortezomib was 8 nM in Hth74, 10 nM in C643 and 10 nM in Hth74. Combinations of IC_{50} concentrations of Bortezomib with valproic acid or AEE788 displayed relevant synergistic effects with an increased antiproliferative activity of up to 100% compared to the single agents. An increase of apoptotic cells of some 10–15% occurred by AEE788 and not by Bortezomib or valproic acid administration.
Conclusion: Proteasome inhibiton leads to significant decreased tumor cell proliferation of anaplastic thyroid cancer cell lines in vitro. Combination of Bortezomib with TKI of EGF-R/VEGF-R or with valproic acid seems to be more effective than single agent strategies. It is suggested that proteasome inhibiton may have therapeutic potential in some anaplastic thyroid cancers.

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MORBIDITY OF SECONDARY COMPLETE THYROID RESECTION IN PATIENTS WITH DIFFERENTIATED THYROID CARCINOMA DEPENDS ON THE TIME OF SURGERY

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Background: Secondary complete thyroidectomy (and lymph node dissection) in patients with differentiated thyroid carcinoma are associated with high morbidity and complication rates. However, the optimal time of surgery is discussed controversially. In the present study we evaluated patient outcome depending on the time of secondary surgery.
Patients and methods: Between 1996 and 2004 87 patients with differentiated thyroid carcinomas (PTC:58, FTC: 29) underwent secondary completion of surgery at the University of Regensburg Medical Center. These patients were divided in three groups depending on the time between initial and secondary surgery: group A: 0–3 days and >3 months, group B: 3–7 days and 7 weeks—3 months, group C: 1–7 weeks. The median follow-up time was 60.5 months.
Results: Operation procedures were comparable in all groups. There was a significant lower number of persistent hypocalcemia in group A compared with group B and C (p<0.042). Moreover, recurrent laryngeal nerve paresis was significantly decreased in group A (p<0.003). Five patients developed local recurrence (5.7%). Overall mortality rate was 5.7%.
Conclusion: Our data suggest that completion of surgery in patients with differentiated thyroid carcinoma within 3 days or more than 3 months after initial surgery reduces morbidity and improves patient outcome.

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RECURRENT GOITER—THE BOOMERANG OF INITIAL SURGERY

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