Reoperation in Recurrent/Persistent Thyroid Carcinoma
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Residual carcinoma present following the initial surgery in 11% of patients with Stage I and II differentiated thyroid cancers

Recurrence following Total Thyroidectomy
N = 2262
Stage I 47%
No gross residual disease after surgery
Stage II 30%
No initial distant metastases
Stage III 23%

Source: NTCTCS, 2001
10 year recurrence: 22%

Risk Factors for Recurrence and Death

Figure 1: Relationship of cancer recurrence and mortality to patient age at time of diagnosis
Figure 2: Relationship of cancer recurrence and mortality to tumor size
Preoperative High Resolution Ultrasound Predicts Outcome in Patients with Differentiated Thyroid Carcinoma

- 338 Consecutive patients (female, male)
- Median age 44.7 years
- Median follow-up 8 years
- Recurrent/persistent disease 0.3%
- 10 year Disease specific survival
  - 98.7% with negative ultrasound
  - 68% with unilateral or bilateral neck disease

Clayman et al., Archives of Oto, 2010

Differentiated Thyroid Cancer

“The indolent behavior of most differentiated thyroid cancers may have surgeons more afraid of potential complications of extensive (appropriate) thyroid surgery than be mindful of the cancer itself.”

H. Goepfert

How do we evaluate a patient with Recurrent or Persistent Thyroid Cancer?

- High Resolution Ultrasound of thyroid bed and bilateral necks
- Serologic studies TSH, Free T4, Thyroglobulin and antibodies
- High Resolution contrast CT scan of head and neck with 1 mm increments
- CT scan of chest
- or PET/CT scan when dedifferentiated/ thyroglobulin negative or other studies are equivocal

Case Presentation (ZH)

- A 23 y.o. female with 2-yr history of Papillary Thyroid Cancer (PTC)
  - Status post total thryoidectomy and neck
  - Thyroglobulin elevated (120 with no abs)
  - RAI Thyroid Cancer Study (TCS) shows no uptake
  - Ultrasound suggests lymph node metastasis in right neck and thyroid bed only.
Case Presentation (ZH)

- **Surgical** history includes:
  - Total Thyroidectomy
  - Left neck dissections x 2
  - Limited Right neck dissection
  - Bilateral paratracheal dissection
- **RAI**
  - 3 therapeutic dosings, cumulative 450 millicuries
  - No uptake past two interventions

CT and MRI in Differentiated Thyroid Ca

- Primary role in recurrent/persistent disease, particularly regarding surgical planning.
- Choice of study dependent upon the expertise and experience of the radiologist/institution
- When diffuse disease is noted, must evaluate for levels of disease evaluated with ultrasound
- May be necessary in large, substernal or minimally mobile masses.
Management (ZH)

- Surgery
  - right neck dissection, completion thyroidectomy, bilateral paratracheal lymph node dissection, superior mediastinal dissection
  - Sestamibi facilitated localization of parathyroid glands x 2
Management (ZH)

- Pathology
  - Right neck 4/42 lymph nodes positive
  - Right paratracheal 4/7 positive
  - Left paratracheal 3/9 positive
  - Thymus with microscopic focus of carcinoma
  - No extracapsular extension

Follow up (ZH)

- Synthroid 0.25mg
- Thyroglobulin non-detectable post-Op
- Vitamin D and Calcium for 8 weeks, calcium for 6 weeks, no further supplementation required
- Follow-up ultrasounds and thyroglobulin at 14 years without recurrence

Safety and Approach of Central Compartment Dissection in Recurrent Thyroid Carcinoma

- 63 Consecutive patients over a 18 month period of time in 2003
- 8 (13%) patients with recurrent disease on only functioning nerve
- Outcome
  - 10 percent hypopara presurgically
  - Additional 5% hypopara post surgical
  - No tracheostomies, no hematomas, 1 chylous leak self limited
  - Length of stay 23 hours in 61/65 patients

Management of central compartment lymph node recurrence in papillary thyroid carcinoma

- 116 patients undergoing a total of 190 comprehensive level VI and superior mediastinal dissections (1991-1998)
- Median age 54 years (range 18-83)
- F:M (3:2)
- Median follow-up 12 years
- Included pathologies
  - Papillary, papillary/follicular, tall cell, insular, poorly differentiated thyroid carcinomas (non-anaplastic), and sclerosing
- Patients ineligible if recurrence present in dermis or solely soft tissue deposits (ECS included)
Central Compartment Recurrent Papillary Thyroid Carcinoma (cont.)

- Median pre-surgical dosage of radioactive iodine 350 millicuries (no patients included with prior XRT in the management of their thyroid malignancy)
- All patients underwent a standardized approach to the central compartment
- 6 patients presented with unilateral vocal cord paralysis
- 11/116 hypoparathyroid on presentation
- Surgeries prior to this intervention
  - 1 (65%)
  - 2 (18%)
  - 3 or more (17%)

Results

- 6 (5%) recurrences in the central compartment
- 5% recurrence in the lateral necks (level II-V)
- 15% (sixteen patients) hypoparathyroid longterm
- Radioactive iodine uptake in 14% of patients
- External beam radiation therapy in 3% of patients
- Kaplan-Meier predicted DS survival at 10 years is 87%
- Pulmonary metastases (at presentation or follow up) in 17% of patients

Conclusions

- Comprehensive dissection of level VI (paratracheal) and superior mediastinum is safe and effective therapy
- Preoperative imaging (CT or MRI) should be performed to optimize surgical planning and identify metastatic disease locations
- Permanent hypoparathyroidism can be minimized
- Central compartment surgery is safe among experienced thyroid surgeons
- The recurrence rate in the lateral neck is 5%
- Longer followup is required

Management of lateral cervical lymph node metastases in recurrent papillary thyroid carcinoma

- 287 patients undergoing a total of 372 comprehensive level II-V dissections (1991-1998)
- Median age 51 years (range 14-84)
- F:M (3:2)
- Median follow-up 12 years
- Included pathologies
  - Papillary, papillary/follicular, tall cell, insular, poorly differentiated thyroid carcinomas (non-anaplastic), and sclerosing
  - Patients ineligible if recurrence present in dermis or solely soft tissue deposits (ECS included)
Recurrent Papillary Thyroid Carcinoma (cont.)

- All patients underwent ultrasound evaluation with or without FNAB confirmation of recurrence
- Median pre-surgical dosage of radioactive iodine 250 millicuries (no patients included with prior XRT in the management of their thyroid malignancy)
- Surgeries prior to this intervention
  - 1 (62%)
  - 2 (23%)
  - 3 or more (15%)

All patients underwent a minimal standard surgical approach of levels II-V neck dissection sparing all anatomically uninvolved structures + central compartment.

Results

- 4 (1.2%) recurrences in the operative lateral neck
- 2 parapharyngeal space
- 1 supraclavicular
- 1 subdigastric
- 5% recurrence in the contralateral neck
- Radioactive iodine uptake in 28% of patients
- External beam radiation therapy in 3% of patients
- Kaplan-Meier predicted at 10 years is 88%
- Pulmonary metastases (at presentation or follow up) in 14% of patients

Analysis of failures in the homolateral neck

- Shellenberger et al. Head and Neck 2007

Recurrence in inferior level IV

- Shellenberger et al. Head and Neck 2007

- Subclavian vein
- Recurrence
Conclusions

• Comprehensive dissection of levels II-V is adequate surgical therapy in patients with recurrent papillary thyroid carcinoma of the antero-lateral neck
• Preoperative imaging (CT or MRI) should be performed to optimize surgical planning and identify metastatic disease in unusual locations
• The role of PET imaging in evaluation of cervical disease has not been determined
• The recurrence rate in the unoperated neck is 5%
• Longer follow-up is required

Differentiated Thyroid Carcinomas

• Soft tissue involvement outside the thyroid (extrathyroidal extension) at the time of initial surgery resulted in 36% local recurrence rate and 18% death from disease. Samaan et al., 1992
• Likelihood of cancer death increased significantly for:
  • Age ≥ 40 yrs.
  • Tumor size ≥ 1.5cm.
  • Local tumor invasion.
  • Regional LN metastasis.
  • Delay in therapy > 12 months (1355 patients) Mazzaferi, 1994 OSU

Case Presentation

• 62 y. o. latin american female with history of papillary thyroid carcinoma 14 years ago treated by total thyroid and bilateral MND
• Presents with recurrence in thyroid bed and left true vocal fold paralysis
• Thryoglobulin 276
• CT chest without metastasis
Pathology

- Extensive soft tissue and tracheal invasion with soft tissue margins free of malignancy
- 0/23 lymph nodes without evidence of metastases

Post operative and XRT radiographic findings
Partial Resection of the Laryngotracheal Apparatus: The Anderson Experience

- Median age 65 (range 54-82)
- All patients reduced to microscopic residual disease
- All patients received post operative external beam radiotherapy
- Median follow-up of 7.8 years

Results

- No recurrence in the laryngotracheal or esophageal organs
- Tracheostomy dependence in 5% of patients; esophageal stenosis 18% (10% g-tube dependence or utilization)
- Pulmonary metastases present or develop in 21% of patients
- Disease specific survival 90% at ten years.

Conclusions- appropriate resection of all gross disease with XRT is effective at controlling the local/regional environment in a population with a predicted l/r recurrence rate of >36%
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Postoperative External Beam XRT For Differentiated Thyroid Cancer: Outcomes and Morbidity with Conformal Treatment

- Survival 79% at 4 years
- IMRT reduced morbidity from 12 to 2%
- 11/15 (73%) of those with gross disease recur locally
- <3% recurrence with microscopic margins

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- One recurrence in the laryngotracheal or esophageal organs
- Tracheostomy dependence in 5% of patients; esophageal stenosis 18% (10% g-tube dependence or utilization)
- Pulmonary metastases present or develop in 21% of patients
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Conclusions- appropriate resection of all gross disease with XRT is effective at controlling the local/regional environment in a population with a predicted l/r recurrence rate of >36%

Happy and Disease Free!