Parathyroid Autotransplantation (PTAT)

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• Surgery of the neck and particularly of the thyroid gland are the most important cause of hypoparathyroidism and hypocalcemia.

• Temporary hypocalcemia was described in 5% to 35% following total thyroidectomy

• Permanent hypocalcemia developed in 0.5% to 4.4%

• In Re-operative Surgery this incidence increased to 5% to 10%

Parathyroid Gland
The treatment of permanent hypoparathyroidism is limited because there is no available hormonal replacement by PTH.

Replacement therapy by Calcium and vitamin D (Alfa D₃) does not restore the autoregulation of blood calcium.
Parathyroid Autotransplantation (PTAT) was first described by F.H. Lahey in 1926.

Immediate Autotransplantation

- Is usually used to prevent hypocalcemia when towards the end of the surgical procedure a devascularized parathyroid gland is noted and immediately transplanted in the sternomastoid muscle.

Delayed Autotransplantation

- The parathyroid gland is preserved (cryopreservation) for future transplantation in the arm muscles for treatment of postoperative hypoparathyroidism
Cryopreservation

71% vs 1% viability for tissue cryopreserved over 24 months. (Guerrero et al. World J Surg 2008; 32: 836-839)

Cryopreservation of parathyroid tissue should be limited to a maximum of 24 months.

Transplantation of extra tissue may result in higher rates of autograft function.

Cryopreservation (in RPMI-1640 and dimethyl sulfoxide) has less success rate than immediate autotransplantation.

Immediate transplantation is successful in 85% to 99%

Delayed transplantation within 2 years is successful in 71%
Autotransplantation of the parathyroid gland
Indications for PTAT

1. Radical head and neck surgery
2. Bilateral total thyroidectomy
3. Huge nodular goiter
4. Recurrent or persistent hyperparathyroidism
5. Primary parathyroid hyperplasia
6. Secondary hyperparathyroidism
7. Completion thyroidectomy
There is an ongoing argument in the recent literature weather the use of preventive routine PTAT actually reduces the risk of permanent hypoparathyroidism.
Routine use of PTAT increases the risk of temporary hypocalcemia, but does not reduce the risk of permanent hypoparathyroidism.


PTAT reduces the risk of permanent hypoparathyroidism.


Olson JA, et al. Parathyroid autotransplantation during thyroidectomy-Results of long-term follow-up

In 194 patients PTAT was successful in 99% with permanent hypoparathyroidism incidence of 1%.

conclusion
Routine PTAT at the time of total thyroidectomy virtually eliminates the complication of permanent hypoparathyroidism.

477 patients (China-Cleveland)

Gr.A- 321 patients, Inferior parathyroid gland autotransplantation
Gr.B- 156 patients, In –situ preservation

Gr. A- 0.9% permanent hypoparathyroidism
Gr. B- 3.8% permanent hypoparathyroidism (p=0.028)
Intraoperative parathyroid hormone as an indicator for parathyroid gland preservation in thyroid surgery. Ezzat WF, et al.  
Swiss Medical Weekly 2011; 141: 1-9  
52 patients

**PTH 15-24 pg/ml** – Recovered to normal PTH levels within 4 weeks. (11 patients)

**PTH >15 pg/ml** failed to regain normal PTH levels up to 12 weeks postoperatively. (5 patients)

Low intraoperative PTH levels at the termination of total thyroidectomy should guide surgeons to re-examine the removed surgical specimen for inadvertently removed normal parathyroid gland for autotransplantation.
Summary
Before termination of a complicated neck exploration (total thyroidectomy, giant goiter, recurrent neck surgery etc.), **PTH level** should be obtained, and the four parathyroid glands should be thoroughly inspected and a gland which was **inadvertently resected** or **devascularized**, should be immediately auto-transplanted in the ipsilateral sternomastoid muscle.
תודה רבה !!!

שאלות ?