

Complications to surgery for primary hyperparathyroidism

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Introduction

The complications after operation for primary hyperparathyroidism are comparable to the complications observed after benign thyroid surgery: laryngeal nerve paresis, hypocalcemia, and bleeding, but they are not as frequent occurring after parathyroid surgery as after thyroid operations.

Postoperative hypocalcemia

The small sizes of the parathyroids make them vulnerable to manipulation during surgery, and their tiny blood vessels are easily damaged. Therefore, parathyroid glands may be damaged and their hormone production may be restricted or completely stopped for a period or permanently after surgery. It is believed that just ½-1 normally functioning parathyroid will be enough for sufficient parathyroid hormone levels after surgery¹. Therefore, in primary surgery virtually no patient will suffer from hypoparathyroidism after surgery if only explored on one side (focused or unilateral ptx)². On the other hand, hypoparathyroidism is observed in up to 1-2% of patients after bilateral exploration³ (ref). The condition is only transient in roughly half the cases, and in these cases parathyroid function usually is normalized within a period of a few months. Hypocalcemia for more than six months is considered permanent. Permanent hypocalcemia after reoperations occurs in up to 20% and transient hypocalcemia is seen in almost 40%⁴.

Postoperative hypocalcemia is also seen as a consequence of so-called “bone hunger”. In these cases, the hypocalcemia is accompanied by normal or slightly elevated parathyroid hormone levels. Patients suffering from this complication of secondary hyperparathyroidism usually have higher preoperative iPTH levels and lower preoperative 25[OH]D levels⁵. The background for the hypocalcemia is continued increased bone remodeling activity after parathyroid surgery. The coupling between resorption and formation is preserved in these patients, and therefore, although the recruitment of new remodeling sites is reduced after surgery, the rebuilding at the formative sites continues for up to 4-6 months and the deposit of calcium in the skeleton during this process gives an extra load on serum calcium, leading to secondary HPT.

Monitoring se-calcium

Ionized se-calcium should be measured the day after operation. If this value is normal then no further measure is needed. Decreased values below 1.10 mmol/l should be controlled the following day supplied by measurement of Se-iPTH. Values below 1.10 mmol/l or in case of signs and symptoms of hypocalcemia (paresthesia, tetany, positive Chvostec test) usually demands treatment.

Treatment

In case of symptoms or calcium values below 1.00 mmol/l, treatment is initiated immediately by per oral calcium and in case of more severe symptoms by intravenous administration of calcium. If treatment is needed for more than a few days, and in case hypoparathyroidism is otherwise expected, the treatment is supplemented with alfacalcidol (Etalfa®). In these cases it is important under consideration of S-iPTH to evaluate whether or not the treatment can be stopped after 1-2 months.

The following medications are used in treatment of postoperative hypocalcemia after parathyroid surgery:

- Calcium Sandoz Forte (brusetabletter), 500 mg; 1-2 tablets dissolved in a glass of water.
- UniKalk with D-vitamin, 400 mg calcium (10 mmol) and 5 µg vitamin-D₃ per tablet; 1 - 2 tablets x 3 per day.
- Etalpha capsules, 1 µg; 1 - 2 caps. per day.
- Calcium Sandoz injection solution, 9 mg/ml (0.22 mmol/ml); 20 ml in 500 ml glucose, infusion over 6 hours.

Injury of the recurrent laryngeal nerve

The recurrent laryngeal nerves have close relationship to the parathyroid glands. Usually the upper parathyroids are located posterior and lateral to the nerves as they approach their entrance to the larynx. The inferior parathyroids have positions anterior to the nerves in close vicinity to the lower pole of the thyroid or in the thyroid-thymic ligament. During the exposure of the parathyroid glands the recurrent laryngeal nerves should always be looked for, although not necessarily exposed, especially not in case of focused operation on the lower glands.

Damage to the external branch of the superior laryngeal nerve is not seen in uncomplicated parathyroid surgery, but could occur if a thyroid procedure is included.

Recurrent laryngeal nerve damage is very seldom seen in relation to primary uncomplicated parathyroid surgery (< 1%-ref). The risk is increased in case of combination with thyroid surgery and in redo-surgery (5%-ref). Intraoperative electrophysiologic nerve monitoring seems to be a valuable adjunct to neck endocrine surgery, and is recommended especially in redo-surgery and when parathyroid surgery is combined with thyroid surgery.⁶

Unilateral damage to the recurrent laryngeal nerve leads to hoarseness with a high pitched voice and air wasting. Most often the symptoms are transient and will resolve in 1-2 months. If not, the patient should be referred to foniatic evaluation and logopedic intervention. Surgical intervention by medialization laryngoplasty eventually with implant material is seldom needed after parathyroid surgery.

Reference List

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