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ORIGINAL ARTICLE

Hypocalcaemia After Total Thyroidectomy: Incidence, Control and Treatment☆

Jesús Herranz González-Botas,* Diana Lourido Piedrahita

Servicio de Otorrinolaringología, Complexo Hospitalario Universitario A Coruña, A Coruña, Spain

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KEYWORDS
Hypocalcaemia;
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Abstract
Introduction: Hypocalcaemia, although usually transitory, is the most frequent complication after total thyroidectomy.
Objective: To identify factors associated with a higher risk of hypoparathyroidism and related to aetiology and surgical procedure.
Materials and methods: A total of 254 total thyroidectomies were analysed for the incidence of transitory or permanent hypocalcaemia based on the relationship with etiological and surgical factors.
Results: Transient hypocalcaemia was present in 29.1% of the cases and permanent hypocalcaemia was present in 4.7%. Postoperative hypocalcaemia was lower in patients with completion thyroidectomy than in patients that underwent total thyroidectomy in a single operation, 12% vs 31%. Patients with Graves–Basedow disease developed postoperative hypocalcaemia in 50% of the cases. Mean recovery time of parathyroid function was 5.2 months, with 72.2% of the patients recovering before 6 months.
Conclusions: Postoperative hypocalcaemia is a frequent complication of total thyroidectomy, but it is seldom permanent. Patients with Graves–Basedow disease have a higher incidence of postoperative hypocalcaemia and need closer follow-up. Postoperative calcium level analysis at 24 and 48 h after surgery is not useful for rapid identification of patients at high risk of hypocalcaemia.

PALABRAS CLAVE
Hipocalcemia;
Tiroidectomía;
Graves-Basedow

Hipocalcemia postiroidectomía total: incidencia, control y tratamiento

Resumen
Introducción: La hipocalcemia es la complicación más frecuente de la tiroidectomía total, si bien pasajera en la mayoría de los casos.
Objetivo: Identificar factores patológicos y quirúrgicos, que pudieran estar asociados a un mayor riesgo de hipocalcemia.

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* Corresponding author.
E-mail address: jesus.herranz.gonzalez.botas@sergas.es (J. Herranz González-Botas).

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Material y método: Se analizaron 254 pacientes sometidos a tiroidectomía total, analizando la incidencia de hipocalcemia postoperatoria y definitiva en función de los factores relacionados con la etiología de la afección tiroidea y los factores quirúrgicos.
Resultados: El 29,1% presentó hipocalcemia postoperatoria y el 4,7% hipocalcemia definitiva. La incidencia de hipocalcemia postoperatoria fue significativamente menor ($p < 0,05$) en pacientes a los que se les completaba la tiroidectomía total en un segundo tiempo, 12 vs 31% cuando se realizaba la tiroidectomía total en un solo tiempo. Los pacientes con Graves-Basedow presentaron hipocalcemia postoperatoria en el 50% de los casos. El tiempo medio de recuperación de la función paratiroidea fue de 5,2 meses y en el 72,2% se produjo antes de los 6 meses.
Conclusiones: La presencia de hipocalcemia postoperatoria es una complicación frecuente de la tiroidectomía total, que se recupera en la mayoría de las ocasiones. Los pacientes con Graves-Basedow tienen un mayor riesgo de padecer esta complicación, por lo que deben ser controlados de forma estrecha. El control postoperatorio a las 24 y 48 h no es útil en la identificación de los pacientes con riesgo de hipocalcemia.

Introduction

Postoperative hypocalcaemia is the most common complication of total thyroidectomy. Its incidence varies between 30% and 60% due to the different criteria used to define it.[1–5] It is not always associated with accompanying symptoms, and in most cases it is resolved in less than 6 months. Multiple factors have been associated with an increased risk of hypocalcaemia, and there are several procedures aimed at quickly identifying which patients may develop hypocalcaemia secondary to treatment.[3,4,6] Rapid identification aims to prevent the resulting clinical symptoms and reduce hospital stay, allowing a faster return of patients to normal activity, as well as a reduction in the cost of the process.

The factors associated with an increased risk of postoperative hypocalcaemia include those related to gender, type of intervention, base condition, identification of the parathyroids and/or manipulation thereof.[1,6–11]

The aim of this retrospective, observational study was to determine the incidence of hypocalcaemia secondary to total thyroidectomy, both primary and secondary, analysing its relationship with surgical technique and aetiological factors which may predict an increased risk, as well as to assess the usefulness of analytical methods employed for the early detection of postoperative hypocalcaemia and evaluate the treatment protocol.

Materials and Methods

We analysed total thyroidectomies, both primary and secondary (completed thyroidectomies in patients who had previously undergone hemithyroidectomy), conducted between January 2006 and June 2011. All patients underwent determination of serum calcium 24 and 48 h after surgery. Corrected calcaemia was calculated in relation to plasma proteins according to the formula: corrected Ca=measured Ca/(proteins/16)+0.55. Postoperative hypocalcaemia was considered when the level of corrected calcium was below 8 mg/dL, regardless of the presence of accompanying symptoms.

During surgery we noted identification and localisation of the parathyroids, as well as the pathology and type of surgery. Postoperative replacement therapy was begun upon the observation of clinical symptoms of hypocalcaemia (numbness, positive Trousseau) or corrected calcium levels below 7.5 mg/dL. The initial treatment in cases of positive symptoms and corrected calcium <8.0 mg/dL was administration of 20 cc of 10% calcium gluconate in a serum of 100 cc passed in 20 min. Simultaneously, we started treatment with oral calcium at a dose of 1 g every 8 h. We administered calcitriol in those cases in which the corrected calcium figures were below 7.5 mg/dL. We considered as permanent hypocalcaemia the need to maintain oral calcium supplementation, with or without calcitriol, for more than 12 months after surgery.

The quantitative variables were expressed as mean±standard deviation and the qualitative variables were expressed as absolute values and percentages with the estimation of 95% CI. In order to compare means we used the Student *t* test or the Mann–Whitney *U* test, as appropriate, after checking the normality of quantitative variables with the Kolmogorov–Smirnov test. The association between qualitative variables was estimated using the chi-square test.

Results

We analysed a total of 254 total thyroidectomies, of which 90.2% (229/254) were performed in 1 time and 9.8% (25/254) were performed in 2 procedures. A total of 83.5% (212/254) patients were female and the mean age was 51.2±15.2 years.

The rate of postoperative hypocalcaemia was 29.1% (74/254) and that of permanent hypocalcaemia was 4.7% (12/254). The mean calcium value at 24 h was 8.3±0.3 mg/dL and 8.7±0.4 mg/dL in patients without hypocalcaemia. Among patients with hypocalcaemia, the mean value at 24 h was 7.5±0.4 mg/dL and 7.7±0.8 mg/dL. The mean recovery time of hypocalcaemia was 5.2±3.7 months, with 72.2% of patients recovering before 6 months.

The incidence of postoperative hypocalcaemia was significantly higher ($P<.05$) among thyroidectomies performed