Case series

Inflammatory bowel disease: an increased risk factor for recurrent laryngeal nerve palsy in thyroid surgery

Malattie infiammatorie intestinali: un fattore di rischio per la paralisi ricorrenziale nella chirurgia della tiroide

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SUMMARY

Transient or permanent recurrent laryngeal nerve palsy is a well known complication in thyroid surgery with reported incidences of 5-8% and 1-3%, respectively. Diplegia has an incidence of 0.4%. Inflammatory bowel disease (IBD) is an important cause of peripheral neuropathy, particularly autonomic neuropathy, which can lead to transient or permanent laryngeal nerve palsy when neural structures are involved during surgery. Several mechanisms have been implicated in the physiopathology of these neurological disorders, but the actual mechanism is still unknown. Herein we report on two patients with IBD presenting with transient bilateral recurrent laryngeal nerve palsy after total thyroidectomy without any evident mechanical or traumatic manoeuvres on apparently preserved nerves.

KEY WORDS: Thyroid surgery • Laryngeal nerve palsy • Inflammatory bowel disease

RIASSUNTO

La paralisi ricorrenziale transitoria o permanente è una possibile complicanza ben conosciuta della chirurgia tiroidea. I dati di Letteratura indicano un’incidenza variabile rispettivamente tra il 5-8% e l’1-3%. La percentuale riportata di diplegia laringea è dello 0.4%. Le malattie infiammatorie intestinali (IBD) rappresentano una causa importante di aumentata sensibilità nervosa periferica, in particolare del sistema nervoso autonomo, che potrebbe spiegare una paralisi transitoria o permanente di strutture nervose coinvolte durante le manovre chirurgiche. Numerosi meccanismi sono stati ipotizzati ma la reale fisiopatologia di tali disfunzioni resta al momento sconosciuta. In questo articolo sono riportati i casi clinici di due pazienti affetti da IBD che hanno presentato una paralisi ricorrenziale bilaterale transitoria dopo essere stati sottoposti a tiroidectomia totale. I nervi ricorrenti una volta identificati sono stati seguiti dalla loro emergenza mediastinica fino all’ingresso nello spazio crico-tiroideo, evitando accuratamente qualsiasi manovra traumatica e soprattutto ogni causticazione nelle immediate vicinanze delle strutture nervose.

PAROLE CHIAVE: Chirurgia della tiroide • Paralisi ricorrenziale • Malattie infiammatorie intestinali

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Introduction

Inflammatory bowel disease (IBD) describes a group of chronic, recurrent intestinal disorders mainly represented by Crohn’s disease (CD) and ulcerative colitis (UC). Concerning the extraintestinal manifestations of IBD, peripheral neuropathy is one of the most frequently reported neurological complications. Autonomic neuropathy (AN) is common in patients with IBD. In CD there is mainly sympathetic dysfunction, while in UC vagal dysfunction is more often observed. Malabsorption due to folic acid or vitamin B12 deficiency or metronidazole therapy may be causal, although the real mechanisms of this neuropathy remain unknown. Increased peripheral neurological sensitivity must be kept in mind during surgery when nervous structures may be involved. Recurrent laryngeal nerve palsy (RLNP) represents the most serious complication in thyroid surgery, resulting in a negative impact on the quality of life. Permanent RLNP is reported to occur in 1-3% of thyroid surgeries, while temporary palsy is seen in 5-8% of cases. Laryngeal diplegia has been reported in 0.4% of thyroid surgeries. We describe two patients with a clinical history for IBD presenting a transient bilateral recurrent laryngeal palsy after total thyroidectomy, although neural integrity was absolutely preserved during surgery and no traumatic manoeuvres were made.

Case series

During the period from January 2002 to December 2010 at the ENT Unit of University of Siena, 482 total thyroidectomies were performed by the same surgeon (GC). We report...
two subjects with a history of IBD who underwent total thyroidec- 
tomy presenting with postoperative bilateral transi- 
tory RLNP, despite the integrity of the nerves which were 
carefully identified and preserved during surgery. Before 
intervention, all patients were submitted to endocrinologic 
evaluation at the Department of Endocrinology, University 
of Siena, with ultrasound and a sonographically guided fine-
needle biopsy of suspected hypoechoic thyroid nodules.

Case 1

A 48-year-old man was admitted to the ENT Unit with a di-
agnosis of micro- and macrofollicular goitre and scheduled 
to undergo surgery. The clinical history showed a diagnosis of 
Crohn’s disease treated with repeated partial ileocecal 
resection at the ages of 34, 40 and 42 years. The patient was 
also in medical therapy with azathioprine and mesalamine. 
The ENT examination was negative except for the thyroid 
region, and vocal cord motility was normal. The patient 
underwent total thyroideectomy. Both laryngeal nerves 
were carefully identified and preserved. In the immediate 
postoperative period, laryngeal diplegia with important 
dyspnea appeared, and an emergency tracheotomy was 
performed. Intravenous steroids (methylprednisone) and 
nutritrophic therapy (cyanocobalamin) was immediately 
started and continued for 2 weeks and 1 month, respec-
tively, after discharge. Complete recovery of laryngeal 
motility was observed 10 days after surgery.

Case 2

A 73-year-old woman presented with a multinodular goi-
itre showing right posterior tracheal deviation and medias-
tinal involvement. Clinical history showed a diagnosis of 
mild chronic gastritis, hiatal hernia and infection with H. 
pylori treated by eradication therapy. The patient was also 
submitted to subtotal colectomy for chronic UC. The ENT 
examination was normal except for the neck, and vocal 
cord motility was preserved.

The patient underwent total thyroideectomy with a con-
ventional procedure: laryngeal nerves were identified and 
preserved, avoiding any traumatic manoeuvres or cau-
terization near the nerve. In the immediate post-operative 
period diplegia with dyspnea appeared. Intravenous stero-
id therapy was administered and tracheostomy was per-
fomed. Complete recovery of recurrent laryngeal nerve 
function was achieved at 22 days after surgery.

Discussion

Disorders of the thyroid gland constitute the second most 
common endocrine disease following diabetes mellitus 8. In 
most cases, total thyroideectomy is the surgical procedure of 
choice, displacing other more conservative procedures as 
subtotal or near-total thyroideectomy. RLNP is the most seri-
ous complication in thyroid surgery. The incidence of RLNP 
is variable, and percentages ranging from 0-4% have been 
reported in the literature 10. An Italian multicentric study on 
14,934 patients documented an incidence of 2% for tran-
sient palsy, 1% for permanent palsy and 0.4% for diplegia 3. 
Permanent RLNP is reported to occur in 1-3% of all thyroid 
surgeries, while temporary recurrent laryngeal nerve injury 
is seen in 5-8% of cases 11. Recently, in a systematic review 
on RLNP after thyroideectomy by Jeannon et al. 1, the mean 
incidence of temporary and permanent RLNP after thyroid 
surgery was 9.8% and 2.3%, respectively, although wide 
variations have been reported. As noted by the Authors, the 
varying rates of RLNP may be dependent upon the method 
of assessment. Nerve lesion may be the result of accidental 
sectioning, thermal insult, excessive isolation of the nerve, 
stretch, oedema, or haematoma 10. In secondary or extended 
surgery, thyroid carcinoma, Graves' disease or inexperience 
of the surgeon 10,12. Anatomical nerve variants, and particu-
larly the relationship with the inferior thyroid artery or the 
presence of a non-recurrent inferior laryngeal nerve, must 
be carefully taken into account 8. In our series of 482 con-
secutive total thyroidecromies, we observed transient or per-
manent unilateral nerve palsy in 2.1% and 1.0% of cases, 
respectively. Two patients affected by IBD showed bilateral 
laryngeal paralysis due to transient bilateral dysfunction of 
the recurrent laryngeal nerves (0.41%).

A broad spectrum of manifestations, including dermato-
logic (erythema nodosum, pyoderma gangrenosum), ocular 
(episcleritis, uveitis), skeletal (peripheral arthropathy, anky-
losing spondylitis, sacroiliitis), vascular (thromboembolic 
disease, vasculitis, arteritis) and hepatobiliary disorders 
(fatty liver, chronic active hepatitis, cirrhosis, primary scl-
erosing cholangitis, cholelithiasis, cholangiocarcinoma) have 
been described to be associated with IBD 13-15. Peripheral 
neuropathies are the most frequently reported extraintestinal 
manifestations 1. In many cases, vitamin B12 deficiency and 
follic acid malabsorption 14 were considered, but the patho-
physiology of these disorders is not yet fully known. Metro-
idazole, due to its ability to promote free radical formation, 
seems to cause damages to nerve fibres 16. Regarding the 
various side effects of mesalamine, peripheral neuropathy 
(< 1/10,000) is a very rare occurrence.

Polyneuropathy, such as paresthesias, muscle weakness and 
muscle pain of lower limbs in patients have also been described 
in patients with IBD without any other predisposing factors, 
suggesting a possible autoimmune mechanism 17. Altered re-
sponse to non-invasive tests based on the heart reactions to 
deep breathing (E/I ratio) and to tilt (acceleration and brake 
indices) has been reported in patients with CD showing au-
tonomic nervous system malfunction in these patients, which 
does not seem to be related to inflammation, malabsorption or 
treatment with immunosuppressive agents 18. A hyperreflexia 
of the autonomic nervous system has been associated with 
inflammation in patients with systemic IBD, although it is un-
clear if this hyperreflexia arises from CNS dysfunction or is it 
a response to inflammation related to IBD 19.
To our knowledge, cases of RLNP in patients with IBD have not been described. However, the case of a 69-year-old man affected by UC who developed bilateral sensorineural hearing loss with altered ABR and bilateral facial palsy improved with steroid therapy has been reported, which was apparently related to autoimmune mechanisms.

In our two patients presenting bilateral RLNP after total thyroidectomy, any traumatic manoeuvre on the recurrent laryngeal nerves was avoided, and the anatomical integrity of both nerves was carefully preserved. The functional recovery of nerve motility was complete in both patients, although at different times.

Conclusions

Injury to the recurrent laryngeal nerve is a major complication in thyroid surgery, and its incidence is strongly linked to anatomical anomalies and the surgeon’s experience. RLNP has a low incidence in experienced hands and can be avoided by proper recognition and isolation of anatomical structures. Nonetheless, risk of injury to the recurrent laryngeal nerve cannot be completely eliminated despite perfect knowledge of anatomy and vast surgical experience if there are secondary conditions that enhance the nervous sensitivity such as IBD. In all patients, before thyroid surgery, it is extremely important to obtain a thorough clinical history paying attention to all diseases which may be associated with increased nerve sensitivity. This is particularly important in patients with IBD or with risk factors for this disease even if still not diagnosed.

Careful ENT examination is necessary with flexible endoscopy to exclude pre-existing unrecognized impaired laryngeal motility. It is also very important to carry out a flexible endoscopic examination to evaluate laryngeal motility on awakening in the immediate post-operative phase, especially in patients with a history of IBD.

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