

# Factors predicting the development of hypothyroidism after radioactive iodine treatment: an audit

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## Background:

The use of radioactive iodine treatment (RAI) for the definitive treatment of benign hyperthyroid disorders has been well established. This study was conducted to determine the factors predicting the development of hypothyroidism following RAI therapy.

## Methods:

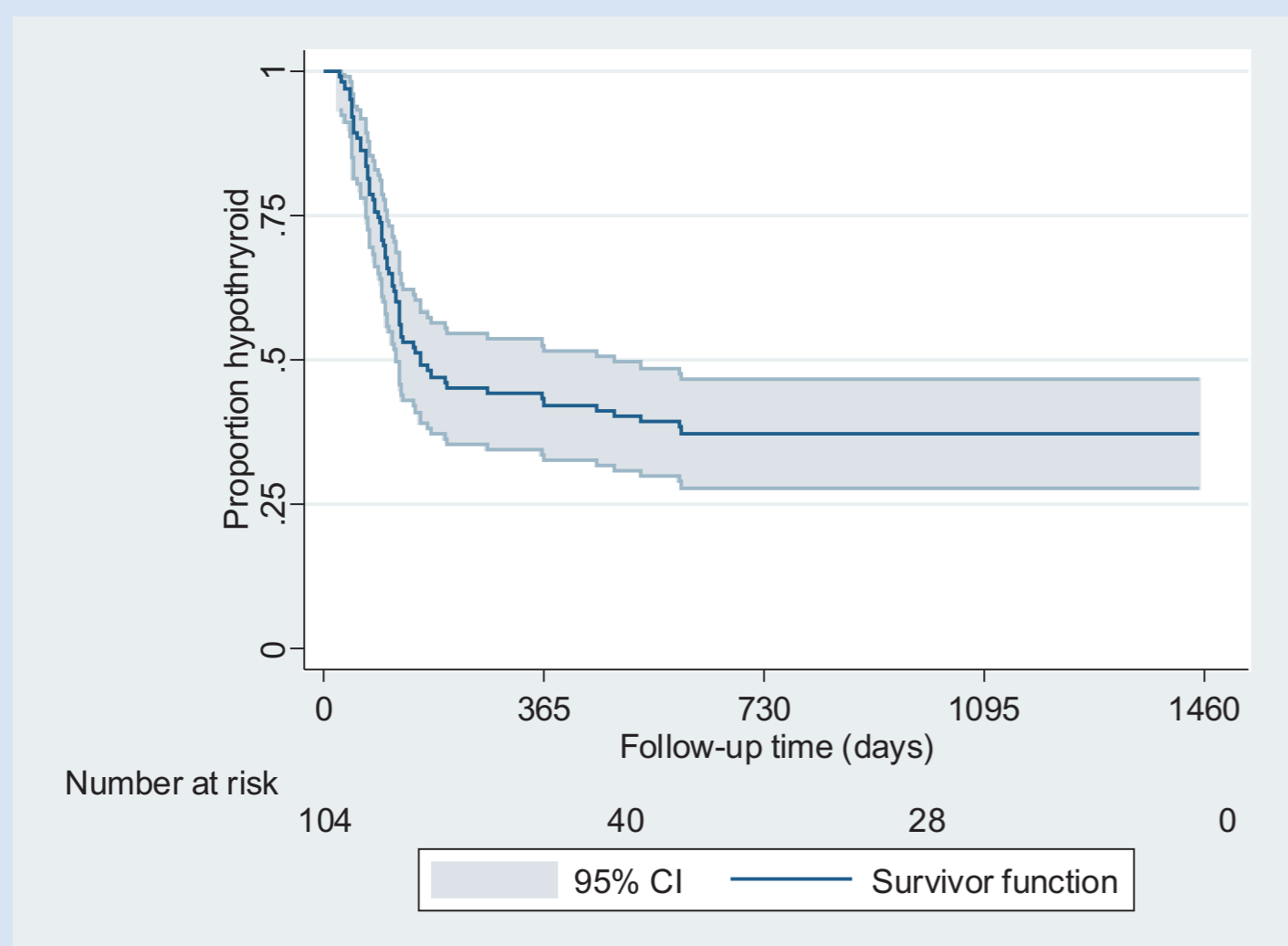
All patients (n=104, 25 men, 79 women) who had RAI for hyperthyroidism between January 2008 and December 2009 were included. In 82.6% of patients antithyroid medications were used prior to RAI treatment.

## Results:

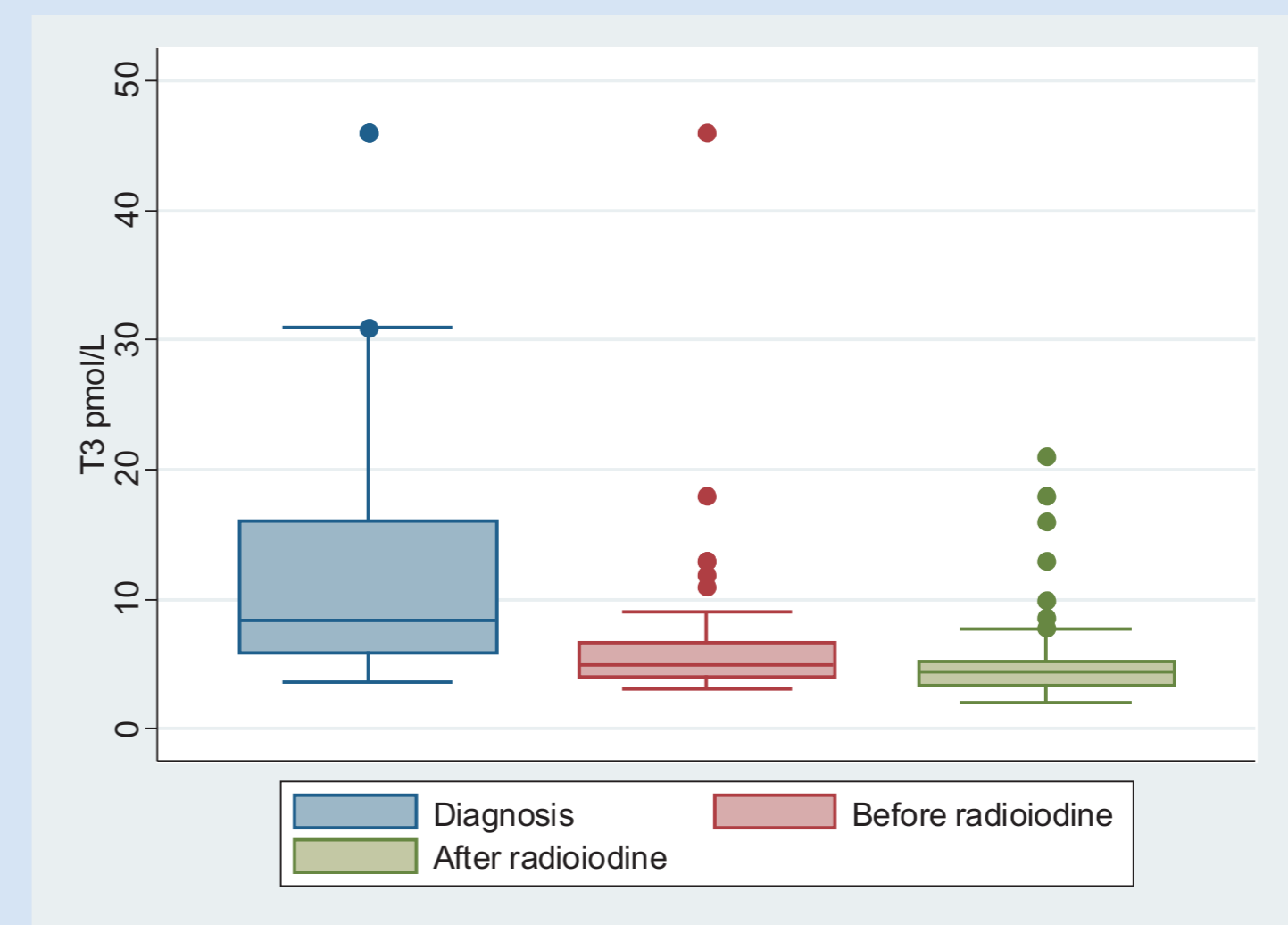
- All patients were administered fixed dose of RAI (mean  $\pm$  SD)(402 $\pm$ 25.4) MBq.
- The median (IQR) age of patients was 58 years (54-62).
- Ninety patients had only one dose of RAI where as fourteen patients received the second RAI treatment after at least 6 months after the first dose which rendered them euthyroid or hypothyroid.
- The success rate of RAI treatment (percentage of patients rendered either hypothyroid (64.4%) or euthyroid (22.1%) after 1 year was 86.5% which is comparable to other studies.
- Sixty seven patients became hypothyroid 138 $\pm$ 132 (IQR 32-560) days post RAI.
- The average dose of thyroxine replacement was 116  $\pm$  39 (range 50-200) micrograms.
- The median values for T3 were 8.3, 5 and 4.4 pmol/L; medians for T4 were 20, 14 and 13 pmol/L; medians for TSH were 0.05, 0.5 and 0.23 mIU/L at diagnosis, before and after treatment respectively.
- When Cox regression analysis was used younger people, lower body mass index (BMI), higher levels of T3 & T4 at diagnosis and prior treatment of antithyroid medications increased the chance of developing hypothyroidism subsequently.
- When Kaplan Meir curve was plotted the risk of development of hypothyroidism was lower after 18 months of RAI treatment. (see graph)

## Summary:

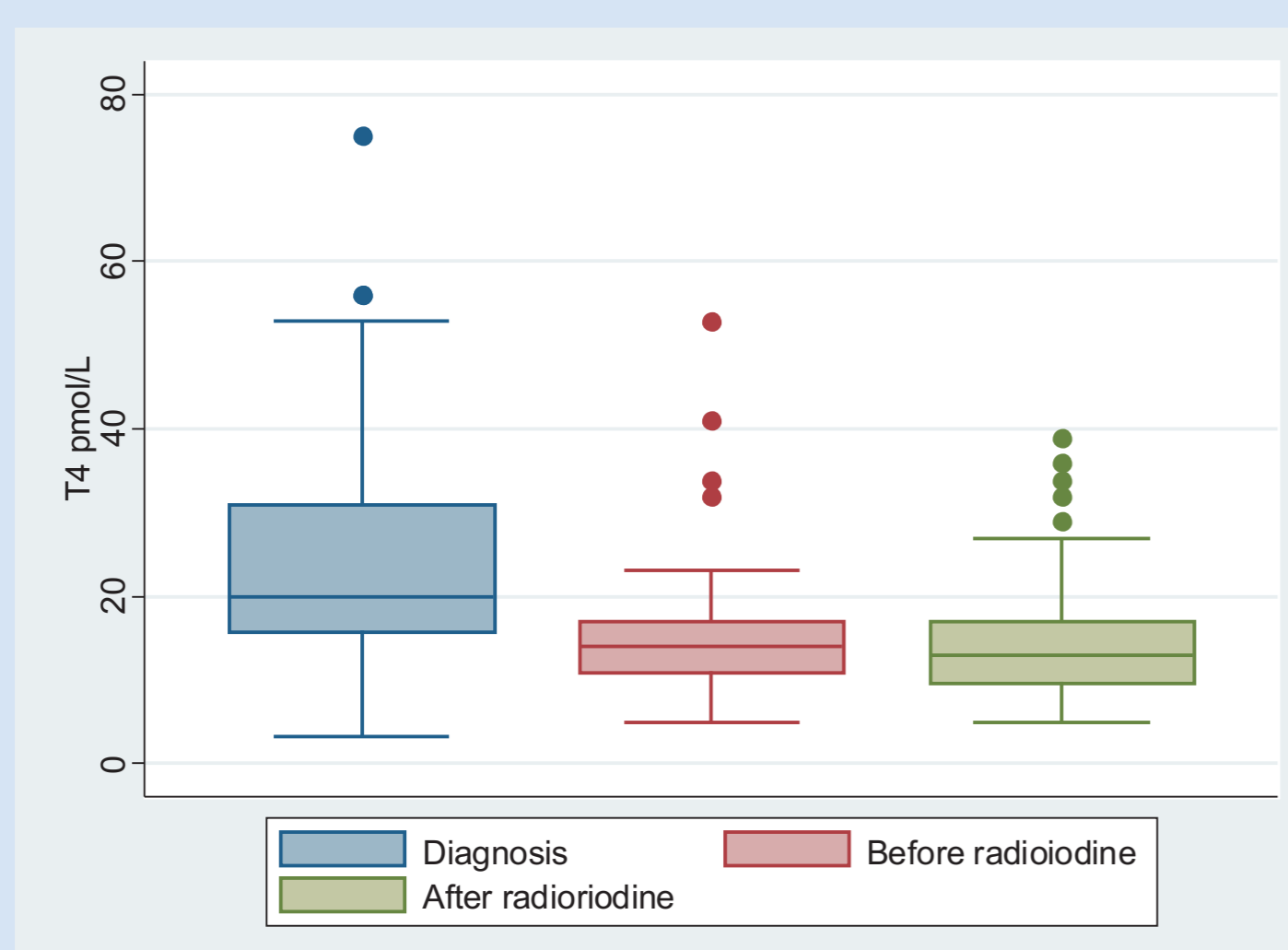
Younger age, lower BMI, higher levels of T3 & T4 at diagnosis and prior treatment with antithyroid medications were associated with subsequent development of hypothyroidism.  
The risk of developing hypothyroidism diminishes 18 months after RAI.



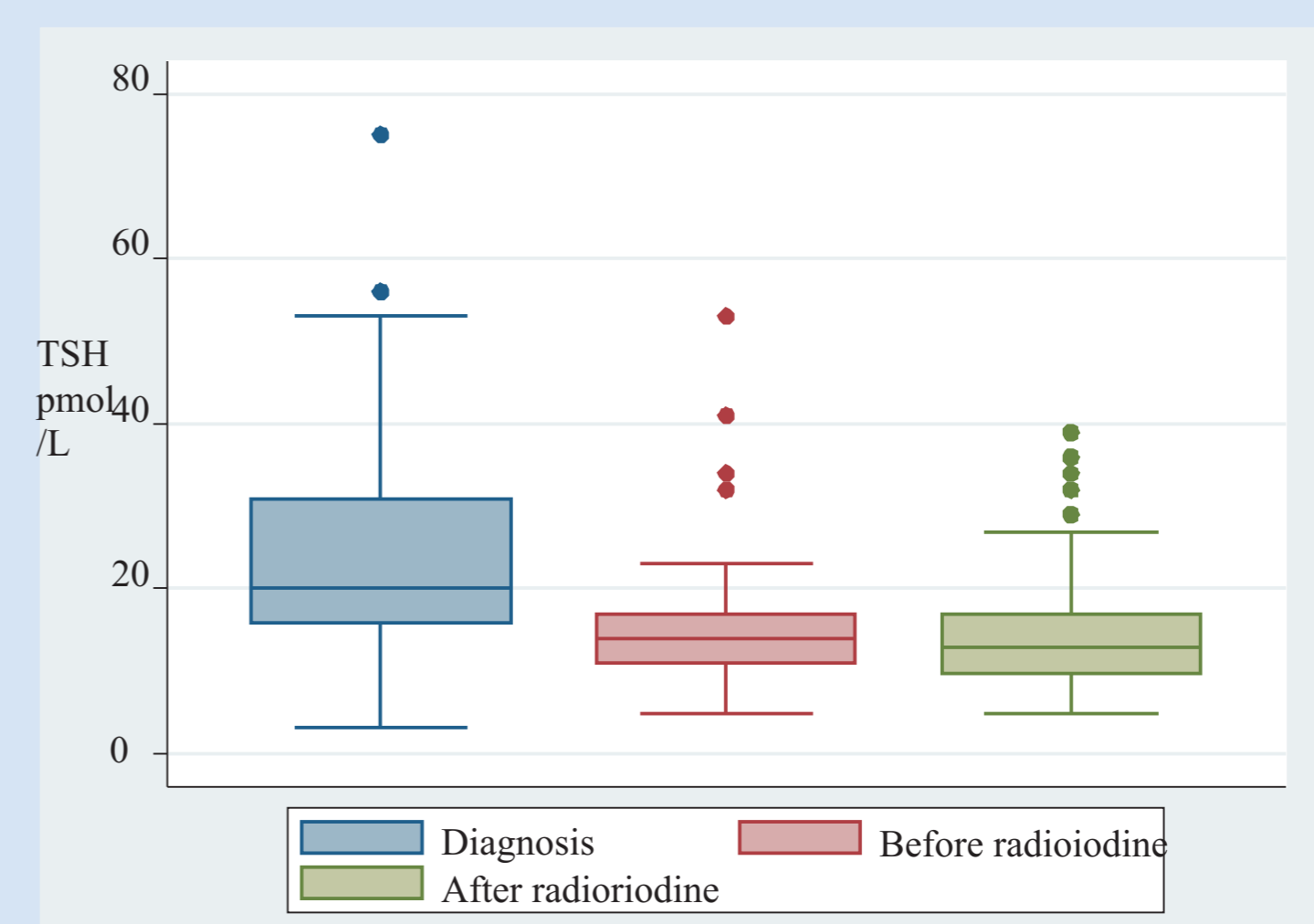
Hypothyroidism Kaplan-Meier curve



Distribution of T3. After' means first value following treatment The median is shown as the centre line inside the box with the 25<sup>th</sup> and 75<sup>th</sup> centiles shown as the lower and upper hinges respectively. The 'whiskers' indicate the lower and upper adjacent values respectively while the circles show extreme values.



'After' means first value following treatment. The median is shown as the centre line inside the box with the 25<sup>th</sup> and 75<sup>th</sup> centiles shown as the lower and upper hinges respectively. The 'whiskers' indicate the lower and upper adjacent values respectively while the circles show extreme values.



Distribution of TSH. After' means first value following treatment The median is shown as the centre line inside the box with the 25<sup>th</sup> and 75<sup>th</sup> centiles shown as the lower and upper hinges respectively. The 'whiskers' indicate the lower and upper adjacent values respectively while the circles show extreme values.

# Octreotide therapy of chronic urticaria and angioedema after gastric bypass procedure

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## Background

Currently, bariatric surgery /weight loss surgery is the most effective therapy for weight reduction. Long term studies have shown that these procedures cause long term weight loss, recovery from diabetes, improvement in cardiovascular risk factors and a relative reduction in mortality. The exact changes of hormones and the relative importance of these to the metabolic improvement after bariatric surgery remain to be explored. We highlight the unusual case of a patient who developed episodes of angioedema post roux-en-y surgery for weight reduction.

## Case

A 38 year old man with a body mass index of 50 kg/m<sup>2</sup>, had laparoscopic Roux-en-y bypass surgery, resulting in 89 kg loss over 12-18 months. Six-12 months post-op he developed recurrent facial angioedema and mild urticaria, lasting for six to twelve hours, relieved with oral steroids and antihistamines. Two of these episodes were associated after taking ibuprofen. A low salicylate diet was ineffective as were multiple antihistamines at up to triple standard doses at preventing the reactions.

Tests for autoimmunity, food allergy, C1 inhibitor deficiency, mast cell tryptase, pheochromocytoma, and carcinoid including octreotide scintigraphy were negative. His plasma gut peptide profile was within the normal range. As several urinary 5-HIAA levels were borderline elevated (52.8, 54.1 and 36.5 umol/d, normal 0-50) he was commenced on octreotide and has since remained symptom free. Attempts to reduce the octreotide dose result in return of symptoms, indicating that he does not just have chronic urticaria that has now resolved.

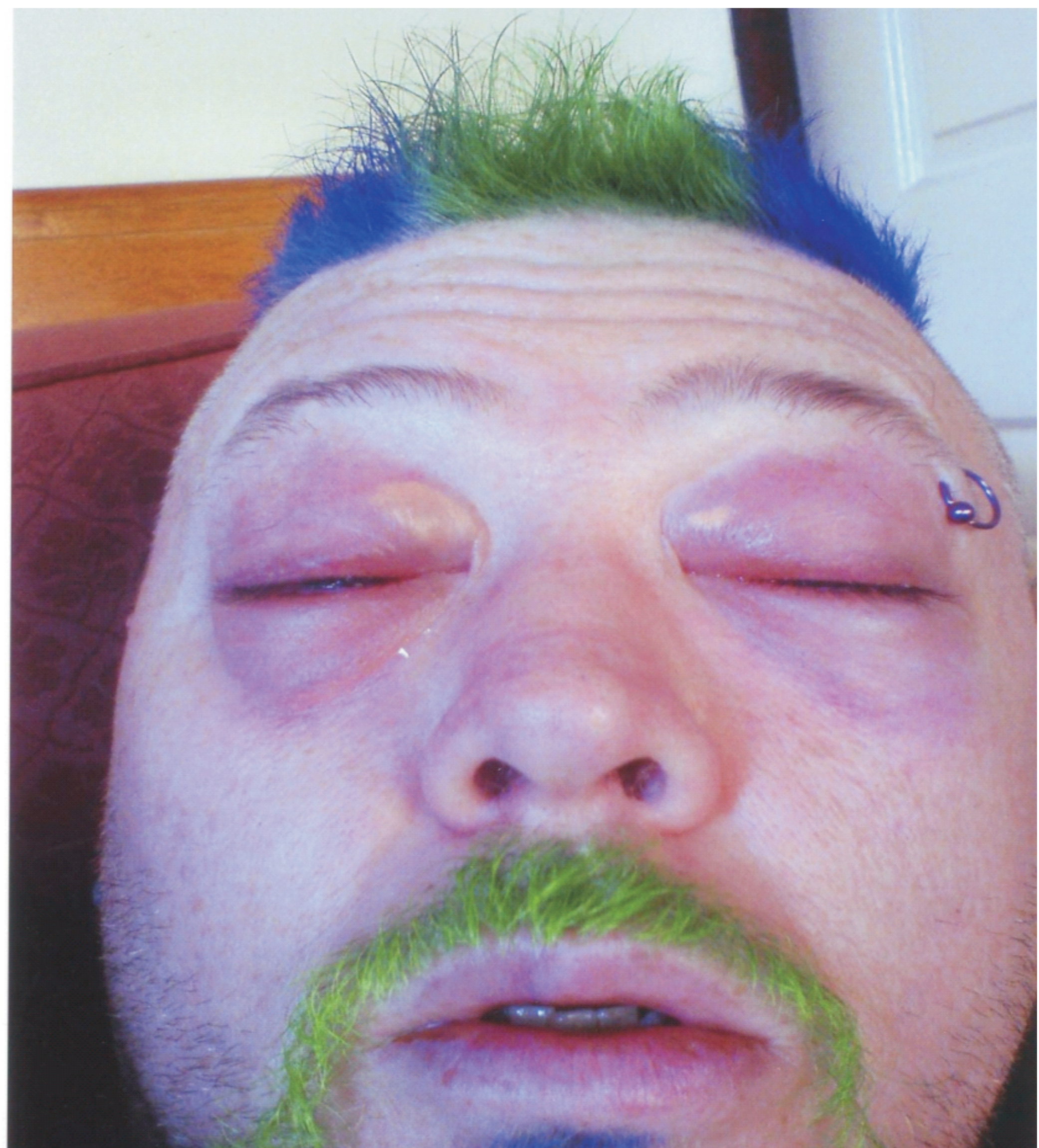
## Discussion

Trials have focussed on hormonal changes affecting improvement in glycemic control post bariatric surgery. They have highlighted the alteration of secretion of hormones in the gut. Studies have also shown that some of the gut peptide hormones undergo significant first pass metabolism and hence a significant intestinal release can go undetected when sampling is limited to peripheral venous blood.

There is progressive rise in peptide YY, enteroglucagon, pancreatic polypeptide and GLP-1 after gastric bypass surgery. Somatostatin and its analogue octreotide inhibit the release of peptide hormones through stimulation of somatostatin receptors and inhibition of L-type calcium channels. Octreotide induced modulation of post bypass satiety gut hormone release is proven in animal models. We hypothesise the response seen in this case is due to modulation of certain gut peptide(s) with angioneurotic properties

## Conclusion

Trials of octreotide therapy may be useful in similar patients.



Picture of the patient during an episode of angioedema. Permission has been obtained from the patient for publishing pictures and data

## References

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