

# Autoimmune Thyroiditis and Autoimmune Hepatitis presenting at onset of Type 1 diabetes (T1D)

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## Introduction

- Autoimmune diseases (AD) occur when there is loss of immunological tolerance to self-antigens.
- AD can be organ specific i.e. T1D or systemic i.e. Systemic Lupus Erythematosus.
- AD commonly co-occur, 25% of patients with a single AD develop another.
- Presence of  $\geq 3$  AD is unusual, has been referred to as Multiple Autoimmune Syndrome (MAS) of which Type 3 involves Autoimmune Thyroiditis and T1D, but not Autoimmune Hepatitis.
- Autoimmune Polyendocrine Syndromes (APS) is group of AD impairing endocrine function. Type 2 APS is presence of 2 of; T1D, Autoimmune Thyroiditis or Addison's Disease. Autoimmune Hepatitis is not commonly associated.
- Co-existence of T1D with autoimmune thyroiditis is 15-30% and 4-9% with coeliac disease  $\rightarrow$  supporting rationale for screening of these auto antibodies (abs) in newly diagnosed T1D.
- Presence of autoimmune hepatitis and either autoimmune thyroiditis or T1D is unusual and co-presentation of all three diseases, to our knowledge, has not been reported.

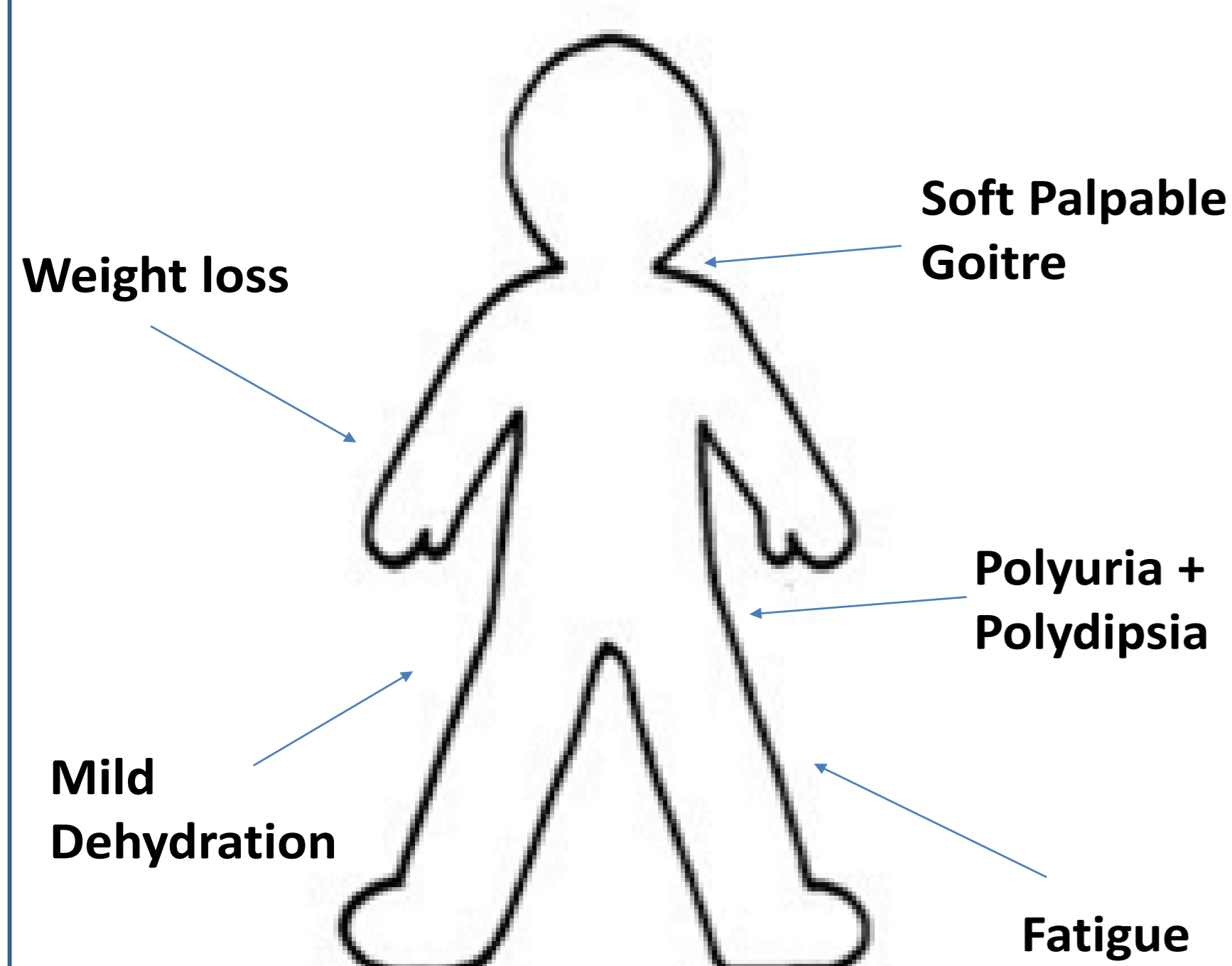
## Case presentation

### HISTORY

- GP referral, 7-year old Caucasian female
- 2 week history of weight loss, polyuria, polydipsia, fatigue and nocturnal enuresis
- Preceded by viral type illness 3 weeks prior
- Past Medical history: Nil significant
- Family history: Nil significant

### EXAMINATION

- Weight 23kg (2<sup>nd</sup> – 9<sup>th</sup> centile)
- Evidence of mild dehydration
- Cardiovascular/respiratory/abdominal examination all normal
- Skin tanned, no signs of dermatological disease
- Soft palpable goiter, no other stigmata of thyroid disease



## Investigations

### BLOODS

	Value	Normal range
Blood pH	7.362	7.35-7.45
Blood glucose	22 mmol/L	
Blood ketones	4 mmol/L	
HbA1c	105 mmol/mol	20-41
Anti-Glutamic Acid Decarboxylase (GAD) abs	>2000 U/ml	Negative <5
Thyroid Stimulating Hormone (TSH)	8.07 mU/L	0.35-4.94
T4	14 pmol/L	9-20
Thyroid Peroxidase (TPO) abs	>3000	
Alanine Aminotransferase (ALT)	1297 U/L	<41
Aspartate transaminase (AST)	1616 U/L	<37
Gamma-glutamyl transferase (GGT)	156 U/L	<45
Bilirubin	41 umol/L	<19
Alkaline Phosphatase (ALP)	504	125-500U/L
Immunoglobulin IgG	27.3g/L	4.9-16.1
Immunoglobulin IgM	3.77g/L	0.5-1.8
ANCA	Positive	
Proteinase 3 abs	21.27 U/ml	<3.5
Complement C4	0.11g/L	0.14-0.54
Liver Kidney Muscle abs	Positive	
Anti Liver Cytosol-1 abs	Positive	
Gastric Parietal Cell antibody	Positive	
Sodium	128	133-146
Creatinine	61 umol/L	18-51
Vitamin D	42.2nmol/L	50-220

### Further autoimmune screen:

- Coeliac screen - negative (TTG <20cu)
- Short synacthen test – normal (baseline cortisol 269 nmol/L, 60 minute cortisol 548 nmol/L)
- ANA - negative
- Complement C3 – normal (0.98 g/L)
- Myeloperoxidase abs – negative (<1.23 g/L)

### Liver screen:

- Clotting including INR/APTT - normal
- Viral serology including Cytomegalovirus, Epstein Barr Virus and Hepatitis B + C - negative
- Alpha-1 antitrypsin - normal (1.6g/L)
- Caeruloplasmin - normal (0.31g/L)
- Serum copper – normal (18.8umol/L)

### IMAGING

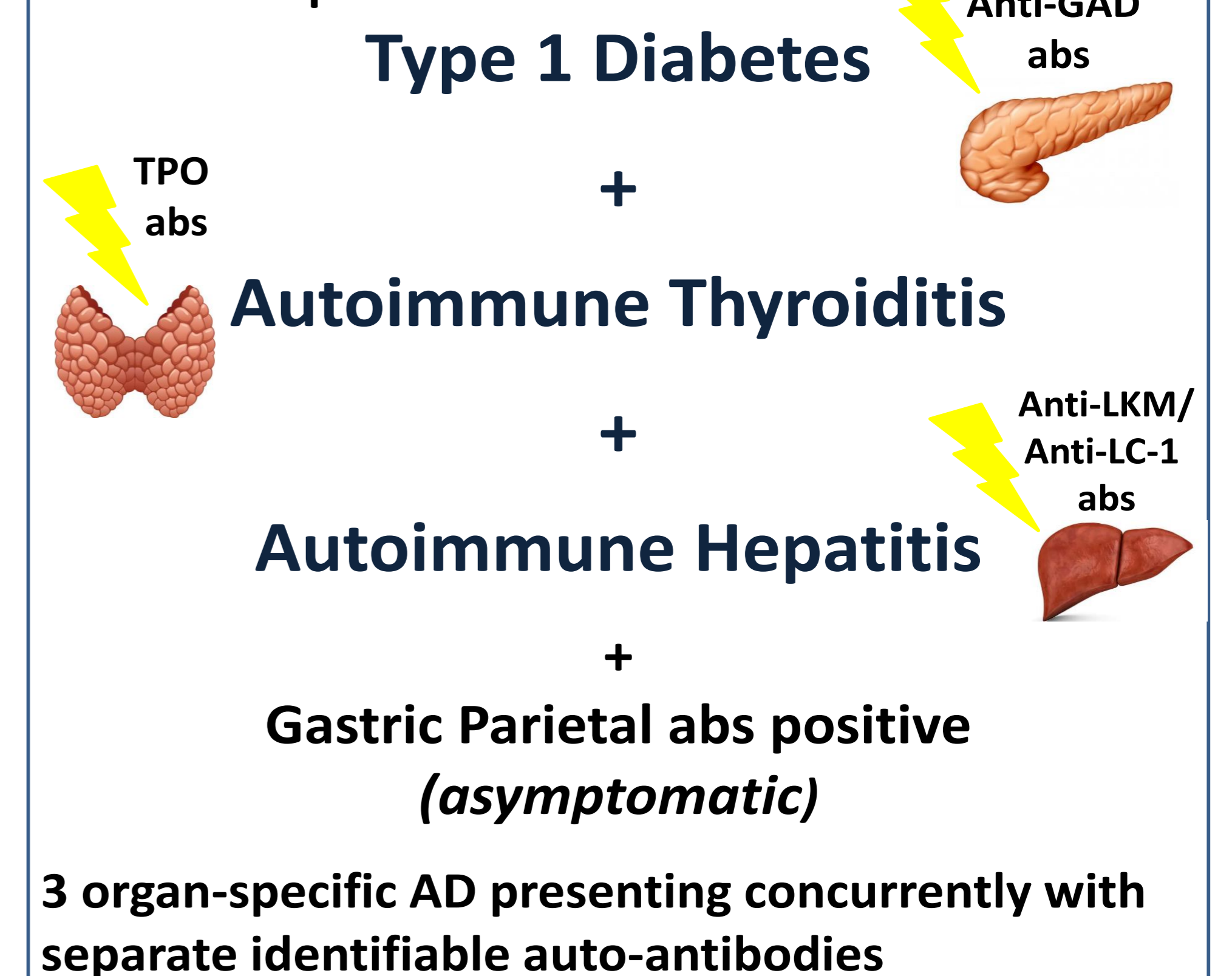
- Ultrasound thyroid: Right lobe measured 3.4 x 1.2 cm, Left lobe measured 3.8x 1.4 cm - both lobes at upper limit of normal size. Abnormal echogenicity in lobes likely to represent thyroiditis
- Ultrasound abdomen: normal appearance of abdominal viscera including liver and pancreas

### HISTOLOGY

- Liver biopsy: Severe acute hepatitis in keeping with autoimmune hepatitis

## Diagnosis

Concurrent presentation of:



## Management

### Type 1 Diabetes

- Basal-Bolus regime of insulin commenced
- Lantus 7 units in evening + Novorapid carbohydrate counting

### Autoimmune Thyroiditis

- Levothyroxine 25mcg daily

### Autoimmune hepatitis

- Steroid therapy - Prednisolone 40mg daily for 8-12 weeks.
- Lansoprazole 15mg daily - gastroprotection
- Weekly monitoring of liver function tests and weaning steroid to response.
- As expected steroids had marked increase in insulin requirement

### Insufficient Vitamin D

- Commenced on multivitamin supplements with 400 International Units Colecalciferol/day

## Discussion

- Rare case of child presenting with T1D, autoimmune thyroiditis and autoimmune hepatitis concurrently. Also with gastric parietal antibody positive but not currently symptomatic for pernicious anaemia.
- Coexistence of these three AD does not fit into either category of MAS or APS and suggests need for more broad definition criteria
- Highlights need for clinicians to have low threshold for investigations into other AD when one AD already exists.
- Preceding viral illness in this case supports theory that infections can initiate or exacerbate AD.
- Raises question of whether screening for other organ-specific autoantibodies beyond coeliac disease and thyroid diseases should form part of initial investigations into newly diagnosed T1D i.e. liver autoantibodies or.

### References

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