

# Thyroid dysfunction in patients following thymus transplantation in a tertiary centre: a 10-year experience

RFC5-004

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## Introduction

- Thymus transplantation is a promising investigational therapy for children with severe immunodeficiency due to primary athymia.
- The two most common adverse affect after thymus transplant are infections and autoimmune disorders .
- Among autoimmune disorders, thyroid dysfunctions (Hashimoto's thyroiditis and Graves' Disease) are the most reported with the incidence between 11-18% .
- Process of thymus transplant is complex as shown in Figure 1.
- After thymus transplant immature T cell from bone marrow undergoes positive and negative selection at transplanted thymic tissue. Abnormalities in the negative selection is primarily responsible for development of autoimmune disorders. (Figure 2)

## Aim

To determine the frequency and aetiologies of thyroid dysfunction following thymus transplantation.

## Methodology

Retrospective review of cases who underwent thymus transplant at Great Ormond Street Hospital between 2008 and 2018.

Figure 1. Process of thymus transplantation

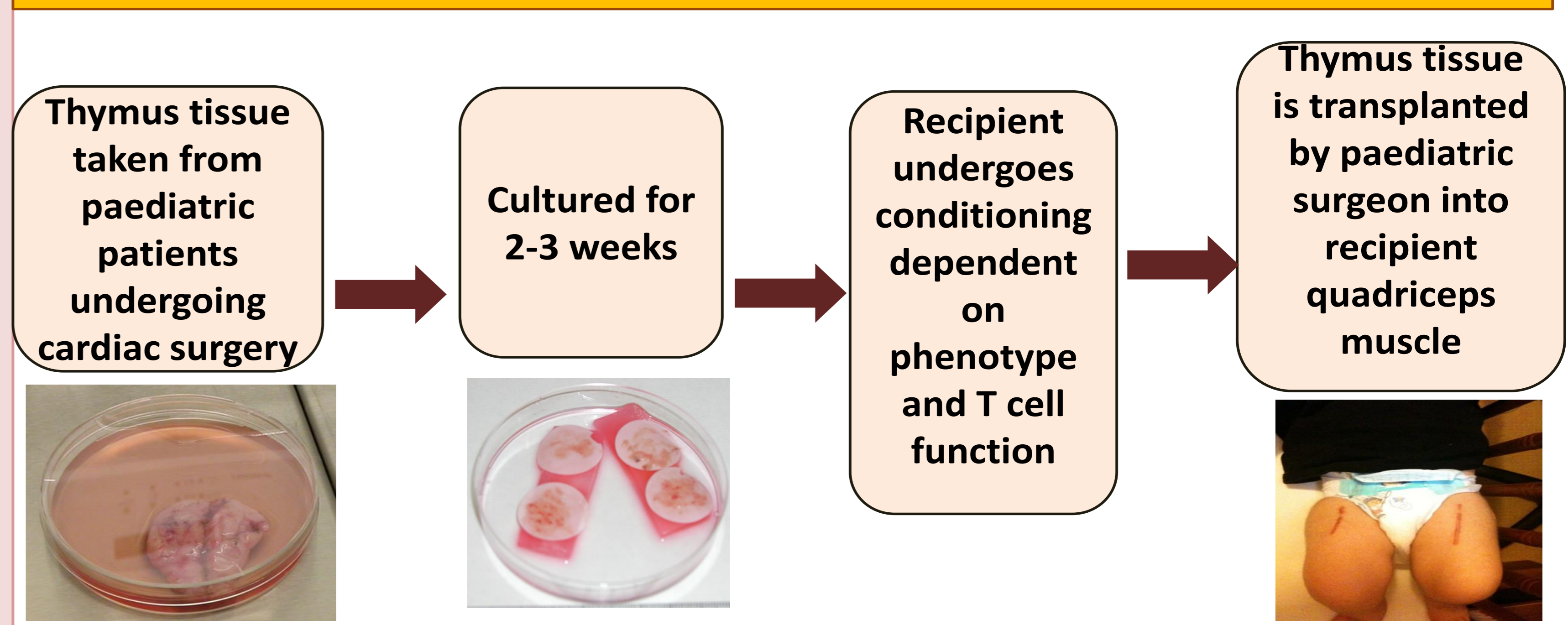
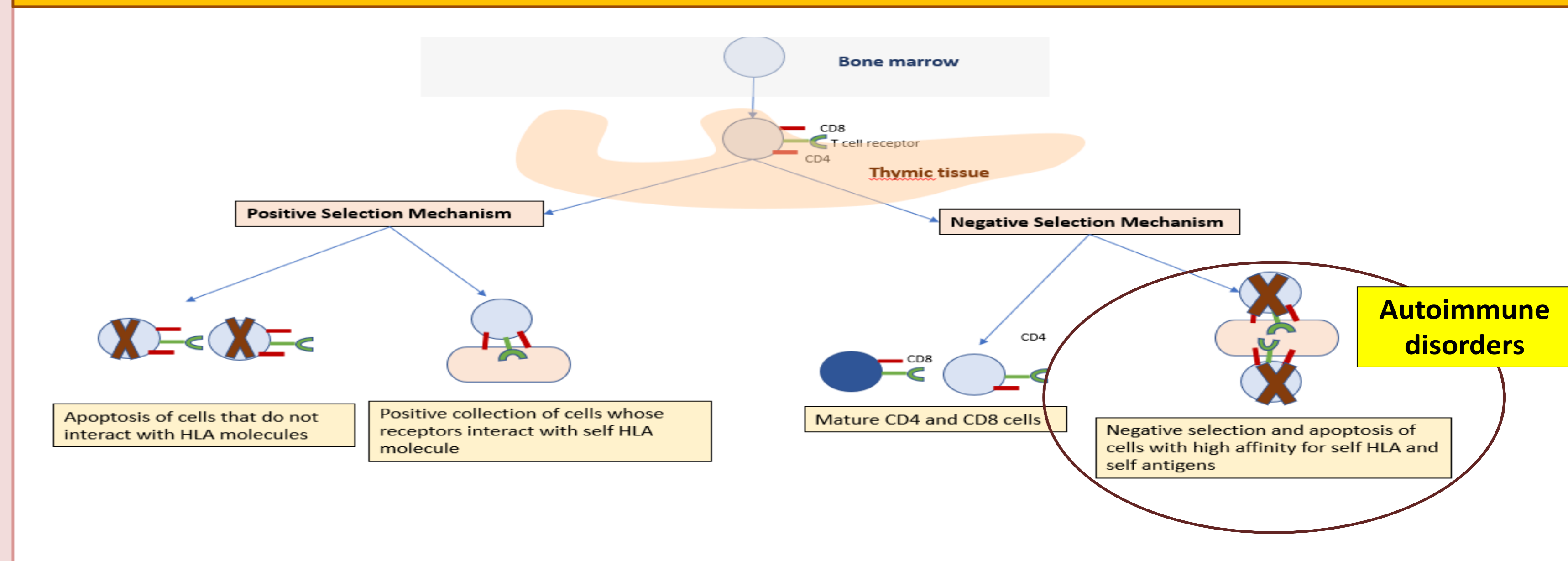
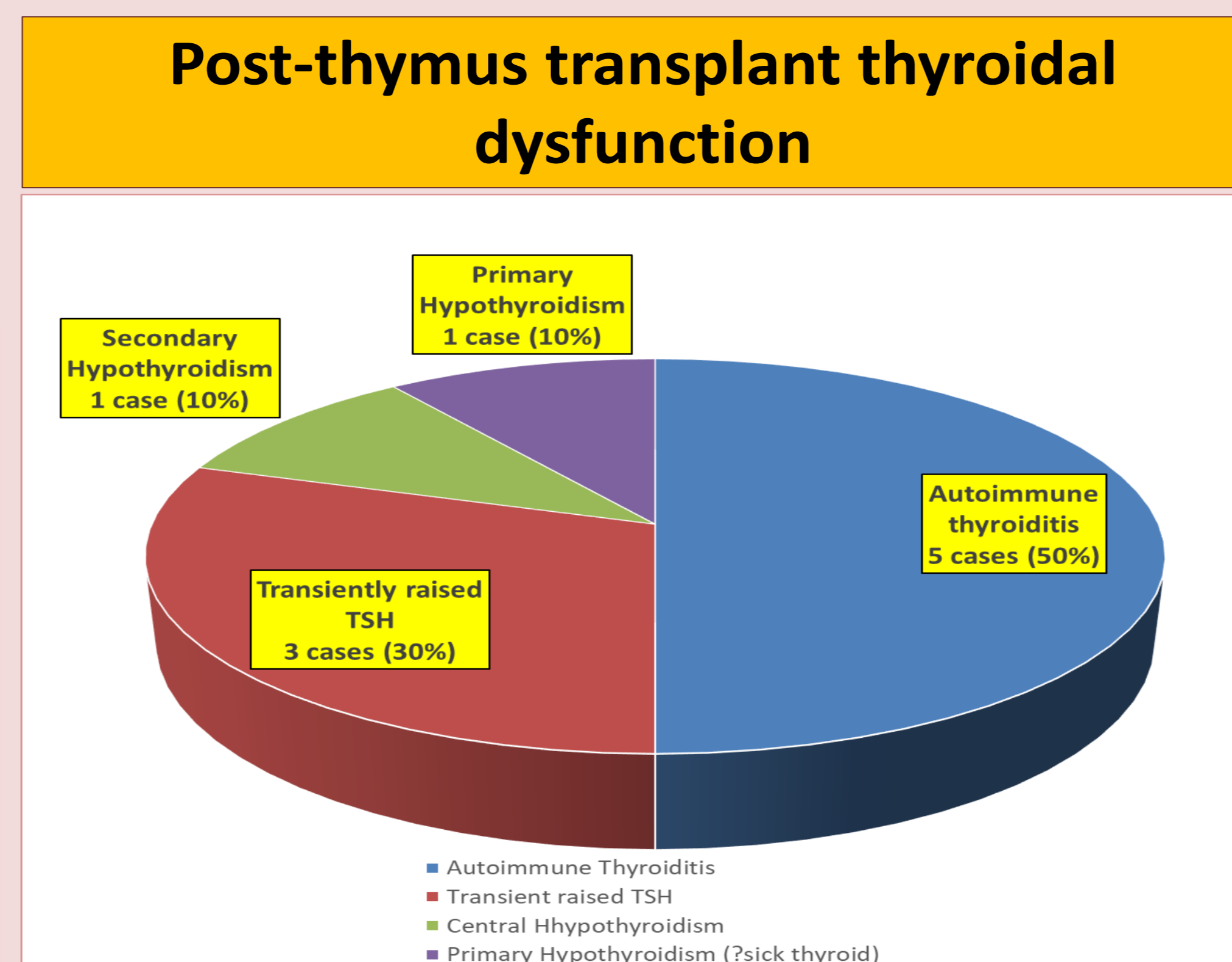
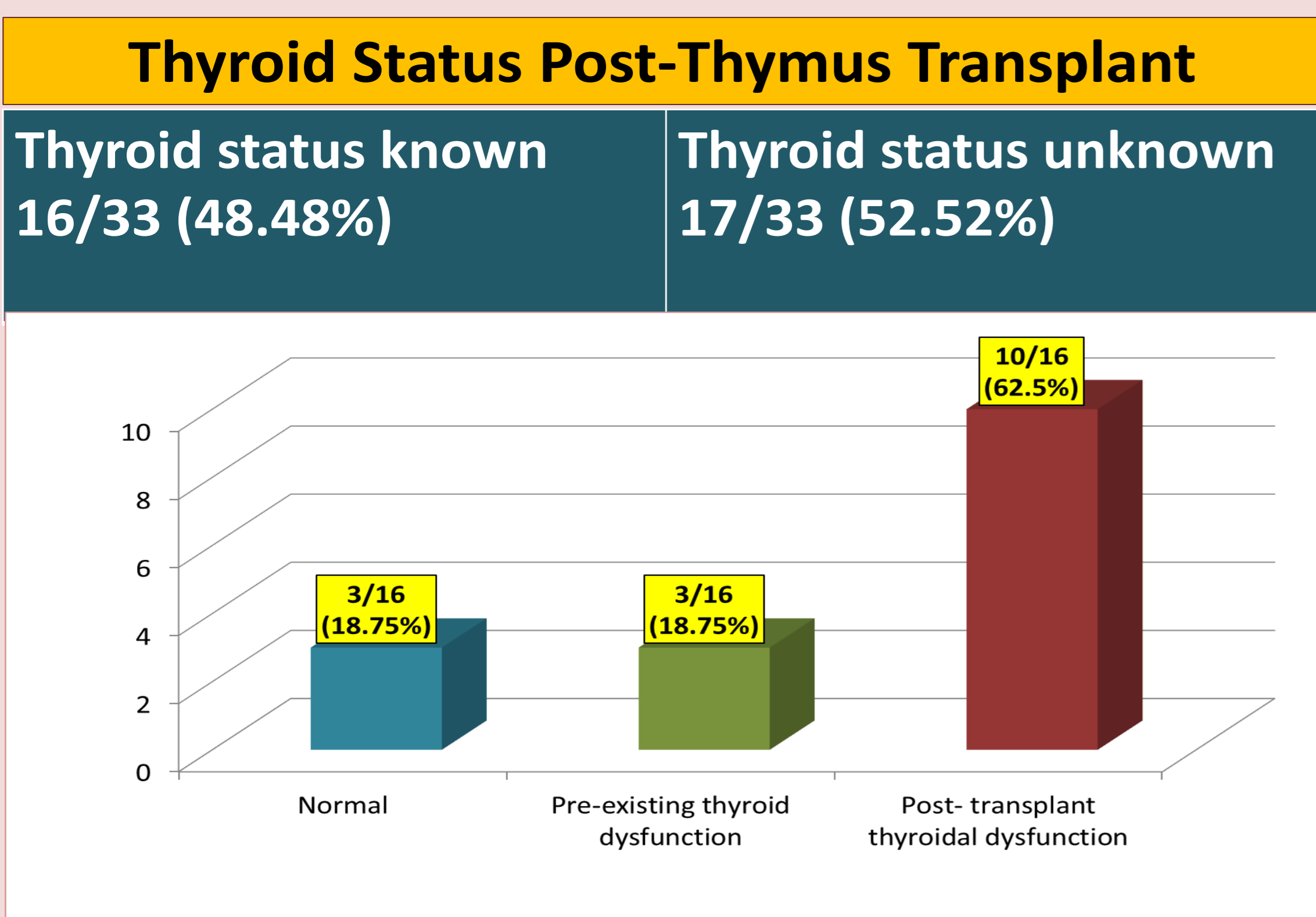
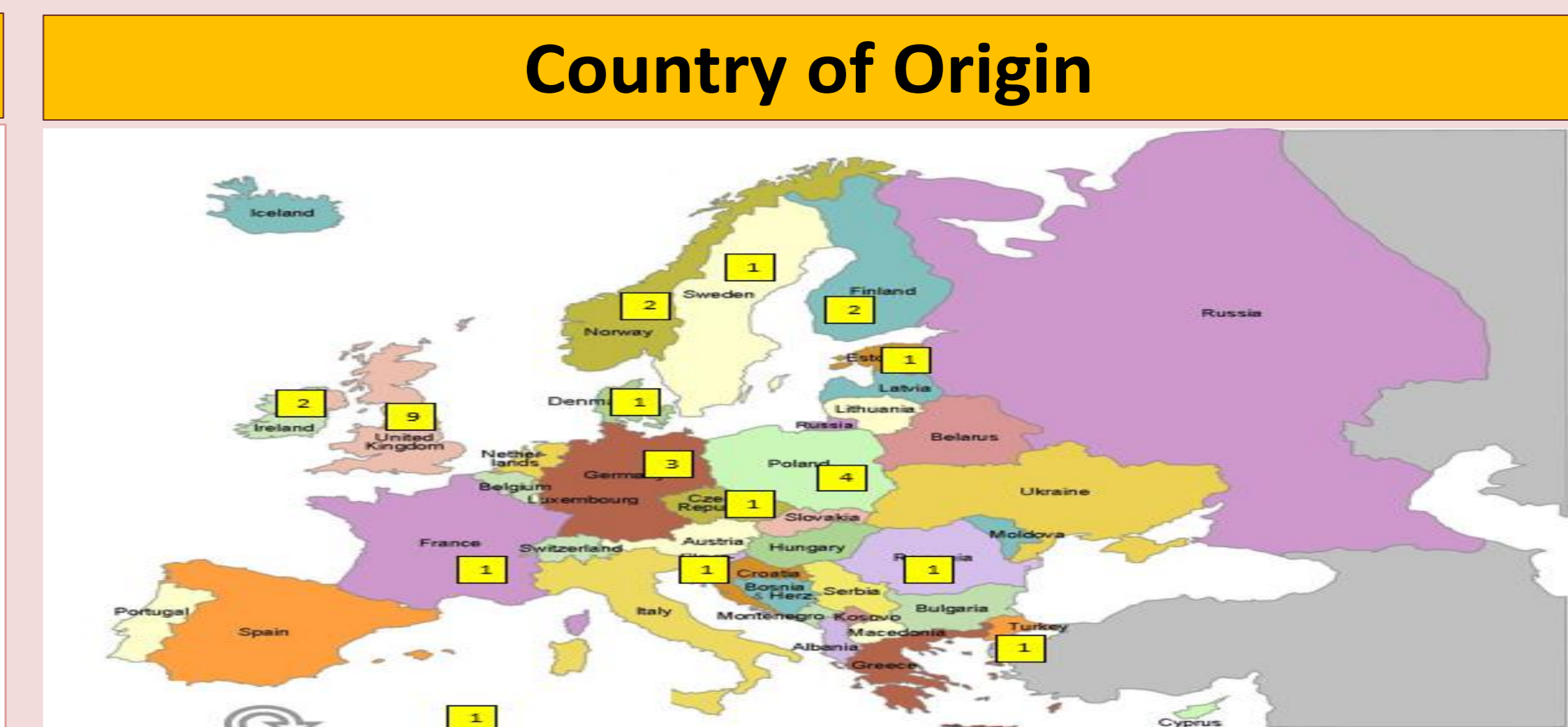
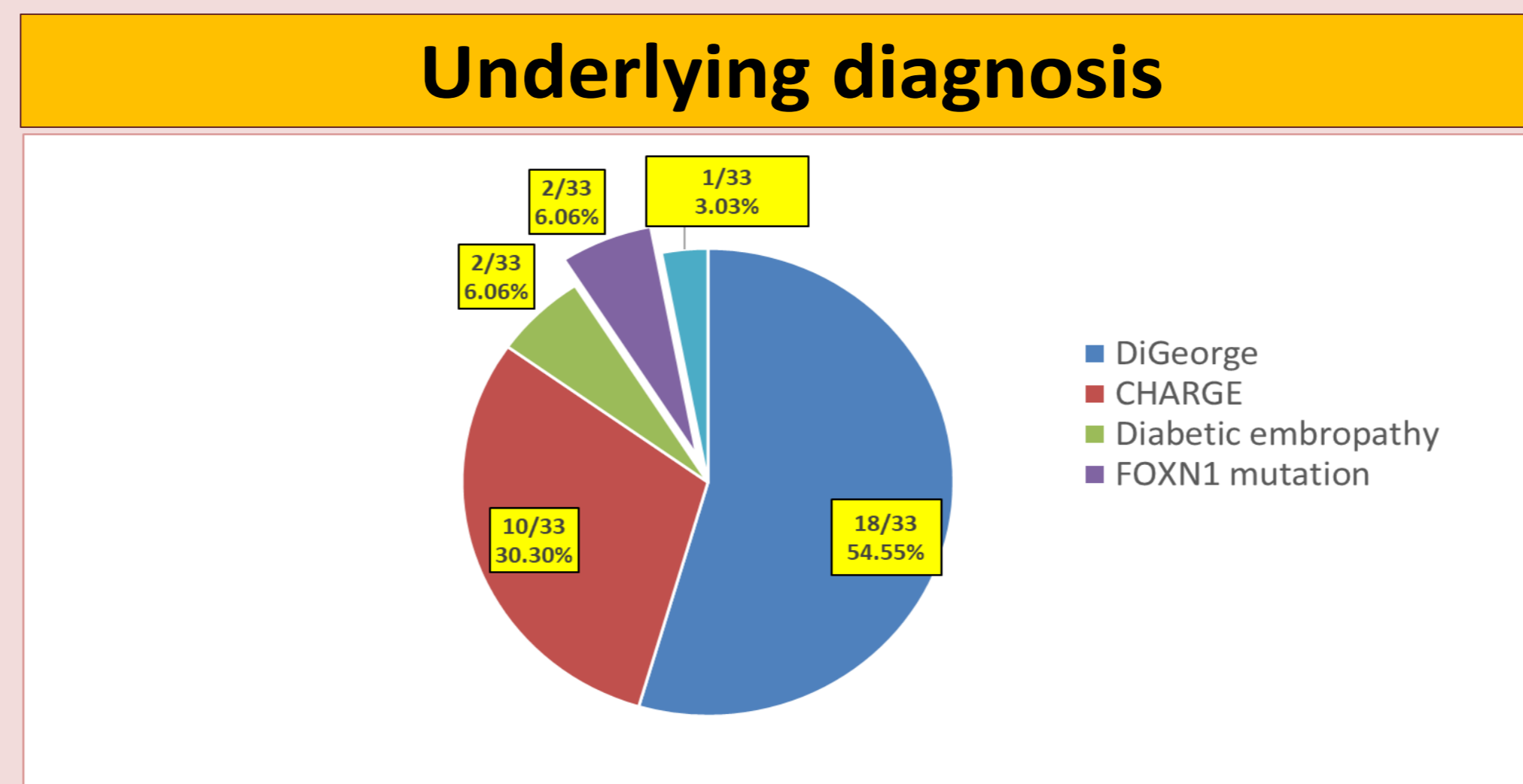


Figure 2. Pathogenesis of Autoimmune disorders after thymus transplant



## Results

Demographic data	
Number	33
Gender	22 males and 11 females
Age at transplant	2 months to 2.2 years Average age 0.8 years



Post thymus transplant autoimmune thyroiditis						
Case	Gender	Underlying Etiology	Age	TFT	Anti-TPO (IU/ml)	Treatment
01	M	CHARGE	1.3 year	TSH 12.7 mU/l FT4 17.6 pmol/l	385	Yes
02	F	CHARGE	1.5 year	TSH 18 mU/l FT4 9.0 pmol/l	62.5	Yes
03	M	DiGeorge	1 year	Abnormal	784	Yes
04	F	DiGeorge	7 month	TSH > 375 mU/L FT4 16.5 pmol/l (Assay interference at level of FT4 – TSH >100 mU/l, FT4 2pmol/l)	191	Diagnosis confirmed after patient's sad demise.
05	F	Diabetic embryopathy	2 year	Normal	116	Not Yet

## Conclusion

- Children with thymus transplant are at risk of thyroid dysfunction especially autoimmune thyroiditis.
- Assay interference should be considered while analyzing TFTs post-thymus transplant.
- Need for standardised evidence-based guidelines.

## References

- Market ML, Devlin HD, McCarthy EA. Thymus Transplantation. Clin Immunol. 2010 May; 135(2): 236-246.
- Market ML, Devlin HD, Alexieff MJ, Li J, MacCarthy EA, Gupton AE et al. Review of 54 patients with complete DiGeorge anomaly enrolled in protocols for thymus transplantation: outcome of 44 consecutive transplants. Blood 2007 May 15; 109(10): 4539-4547.

