

Use of subcapsular saline injection (SCASI) during thyroid surgery to reduce postoperative temporary and permanent hypoparathyroidism - a randomised controlled trial

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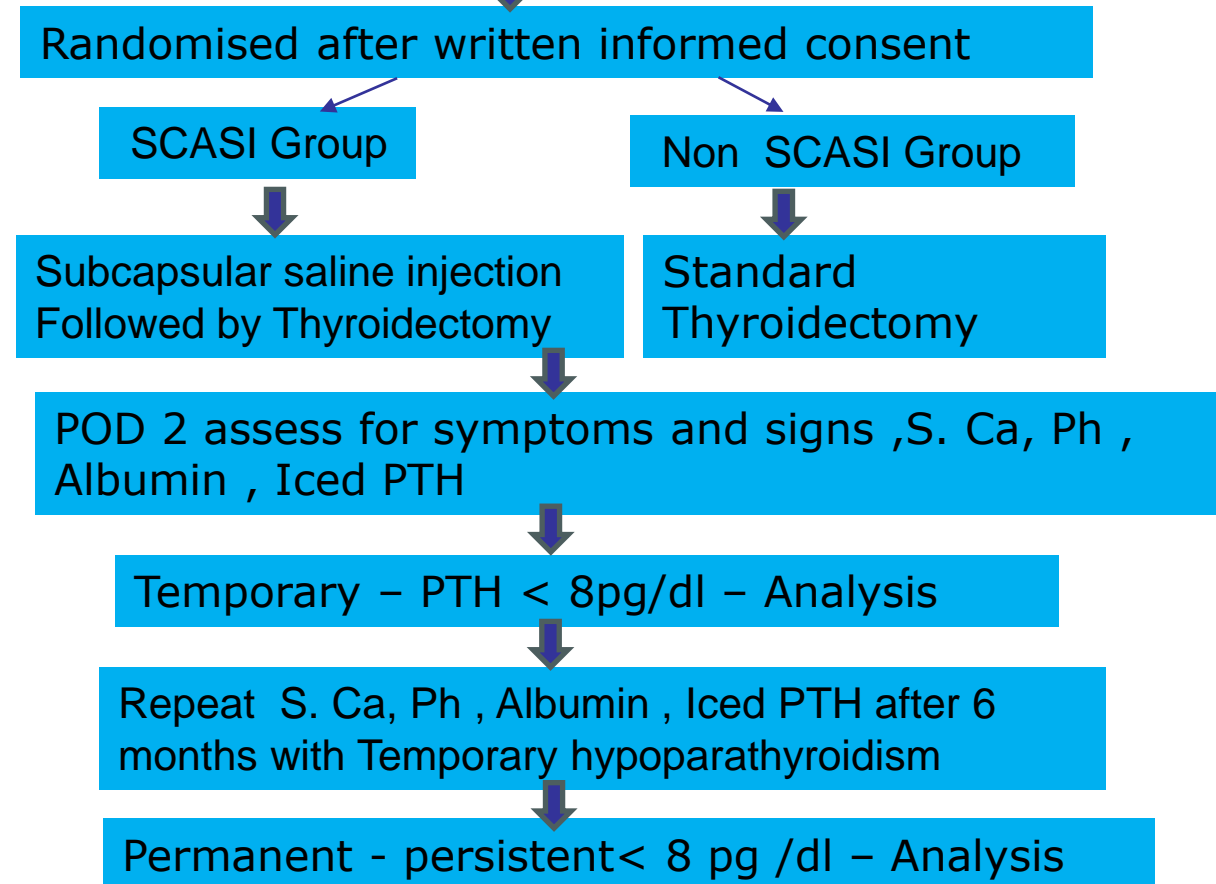
Introduction

Total thyroidectomy is the most common elective endocrine surgical procedures performed worldwide for both benign and malignant thyroid conditions and this procedure can be complicated by post-thyroidectomy hypoparathyroidism, the incidence varying up to 50%. Inadvertent removal, mechanical or thermal injury to the parathyroid glands remains the most common cause. Recent techniques such as indocyanine green angiography, carbon nanoparticles and gamma probe have reported reduced incidence of post-thyroidectomy hypoparathyroidism but these techniques are limited by time and cost. Recently there have been two reports describing a simple technique - subcapsular injection of saline (SCASI) during thyroid surgery to reduce post-operative hypoparathyroidism. We conducted RCT to evaluate role of SCASI in aiding parathyroid dissection, reducing injury and post operative hypoparathyroidism.

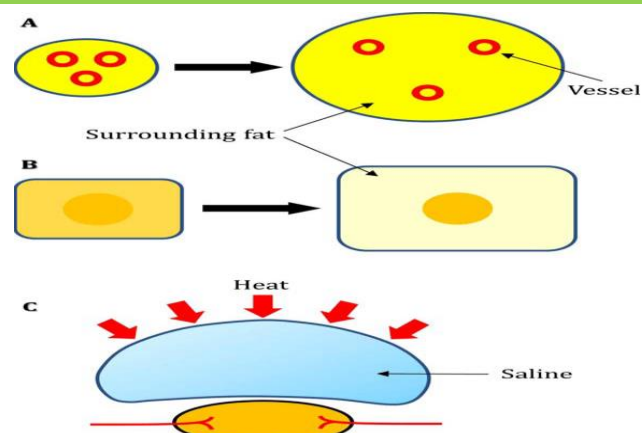
Materials and method

Randomised controlled trial - SCASI and Non SCASI
March 2022 - May 2023
Sample size: 330 patients (SCASI 168, Non SCASI 162)
Statistical analysis
t-test for the analysis of continuous data with Normal distribution
Mann-Whitney U test for data with non- Normal distribution with groups (SCASI & Non- SCASI).
Chi-square test performed for categorical variables with groups
Differences considered significant at $p < 0.05$
Statistical analyses was performed using SPSS 25.0
CTRI : 2022/03/040913

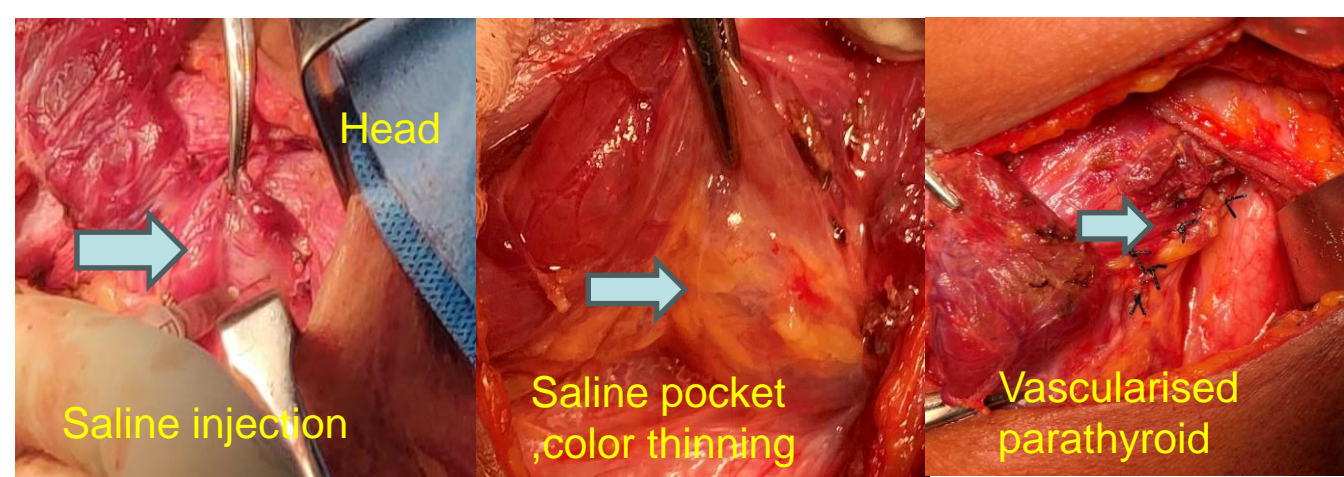
Patients admitted for Total Thyroidectomy +/- LND



SCASI Mechanism and technique



- A) Space expander effect
- B) Color thinning (extraction) effect
- C) Saline pocket effect



Results

Clinicopathological profile

Gender (M: F)	8:25
Histopathology	
Benign	117(35.5%)
Malignant	213(64.5%)
Micro PTC -55	
PTC - 90	
FVPTC - 60	
MTC - 6	
FTC -2	

Temporary hypoparathyroidism

Surgery	SCASI	Temporary Hypoparathyroidism	Non SCASI	Temporary Hypoparathyroidism	p Value
TT	135	24(17.8%)	133	30(22.6%)	0.33
TT+ CCND	14	5 (37.5%)	8	3(37.5%)	0.93
TT+ U/L SLND	8	2(25%)	16	4(25%)	1
TT+B/L SLND	9	8(88.9%)	2	1(50%)	0.19
TT+other	2	1(50%)	3	1(33.3%)	-
Total	168	40(23.8%)	162	39(24.1%)	0.9

Permanent hypoparathyroidism

PTH value	SCASI	Non SCASI	p value
> 8pg/dl	32	31	
< 8pg /dl	1	3	
Lost Follow up	7	5	
Total	40	39	0.3

Discussion

	CMC , Vellore	Choi et al
Type of study	RCT	Retrospective cohort
Experience	Single centre, Multiple surgeons	Single centre and Endocrine surgeon
Temporary Hypoparathyroidism	SCASI- 23.8 % Non SCASI 24.1% p value - 0.96	SCASI -19% Non SCASI 35.7% p value - <0.001
Permanent Hypoparathyroidism	SCASI- 3 % Non SCASI- 8.8% P Value -0.3	SCASI- 0%, Non SCASI - 4% p value -0.04

Conclusion

In the current study, SCASI did not show a significant reduction in the rates of post-thyroidectomy hypoparathyroidism compared to the non SCASI group. However, it was interesting to note more patients with recorded permanent hypoparathyroidism belonged to the non-SCASI group and SCASI was practically beneficial as it helped in parathyroid gland identification, in addition to enhancing the planes for dissection and reducing heat transmission.