

INDOCYANINE GREEN NEAR-INFRARED FLUORESCENCE NOVEL SCORE PREDICTS POST-THYROIDECTOMY HYPOCALCEMIA

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Introduction: This cross matched study evaluates a new protocol that employs Indocyanine Green Near infra-Red technology (ICG-NiR) to reduce postoperative hypoparathyroidism after thyroid surgery

Material and Methods: 156 consecutive thyroidectomy patients treated with ICG-guided NiR fluorescence procedure (ICG-group) and 156 conventional thyroid patients matched 1:1. This method utilises the Stryker Spy-phi NiR fluorescent imaging system (Stryker™, Portage, USA)'s three modes: green, black/white, and coloured. All four parathyroid glands were scored again, and the overall score was calculated. The postoperative patients were divided into hypoparathyroidism and euparathyroidism.



	right upper	right lower	left upper	left lower	Total score
number of glands found					
Black/white, 0= no contrast 1=partial or low contrast, 2= high contrast					
Green, 0= no green, 1=partial green staining, 2= complete green staining					
coloured; 0= grey staining, 1=blue staining, 2= brown staining, 4=red staining					
Total: minimal score/Gland =0 and maximal score/Gland =9					

Table used to calculate Burjeel ICG Score

Figure illustrate the setting using the SPY-PHI NiR fluorescent system (Stryker™, Portage, USA)

Results:

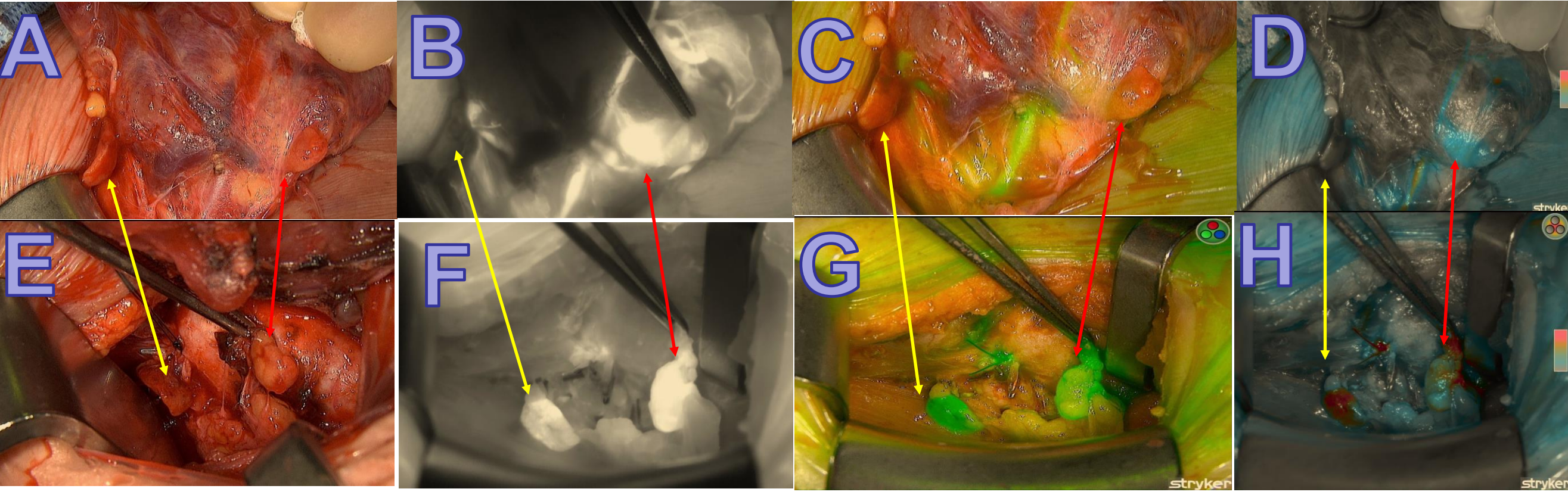


Figure 2; A= pre ICG Injection Visualization of both Parathyroids on right side, B= initial visualization of parathyroids in black/white mode with its bloodsupply, C= green mode, D= in coloured mode, E= native image after completion of Lobectomy, F= black/white mode image of both parathyroids after completion of Lobectomy, G= Green mode image of both parathyroids after completion of Lobectomy, H= coloured mode image of both parathyroids after completion of Lobectomy, yellow Arrow indicates right upper parathyroid, red Arrow indicates right lower parathyroid

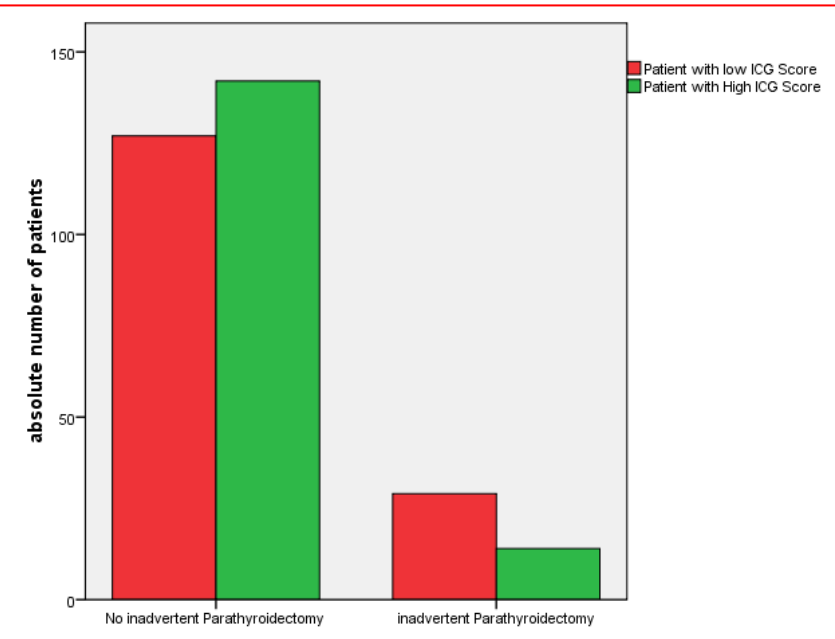
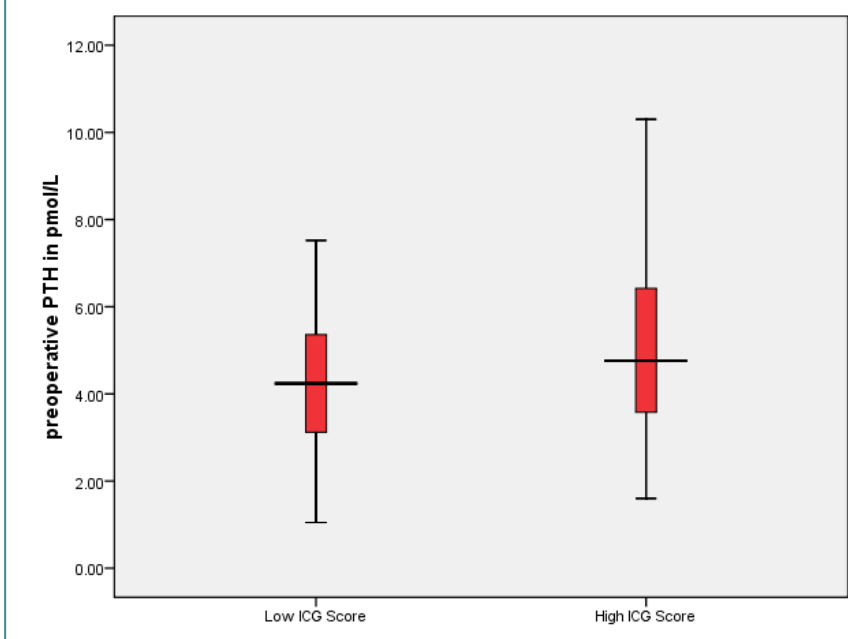
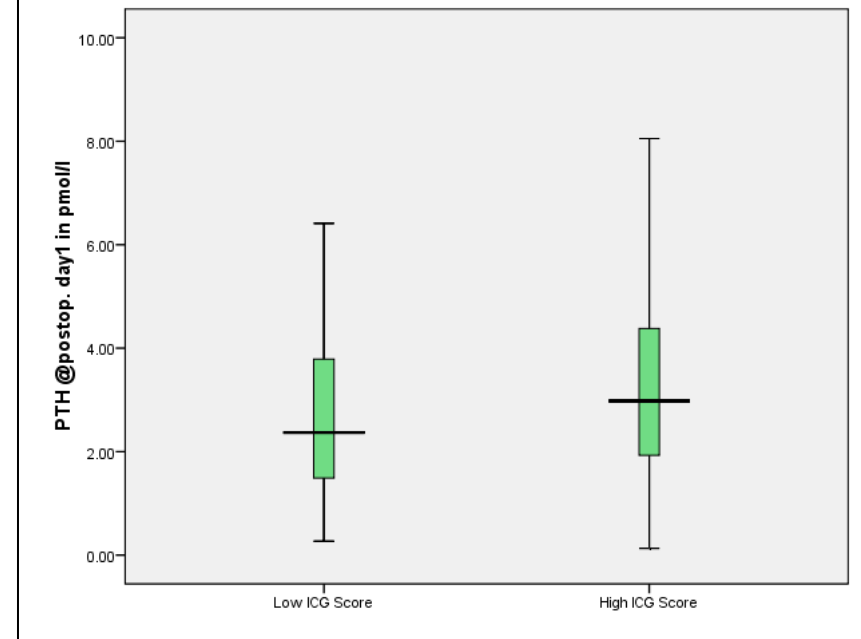


Figure showing correlation of Burjeel ICG Score and inadvertent parathyroidectomy (Chi-square test, $p = 0.021$)



Boxplots showing correlation between Burjeel ICG Score and preoperative PTH_level in pmol/L @ first postoperative Day (t -test, $p = 0.374$)



Boxplots showing correlation between Burjeel ICG Score and postoperative PTH_level in pmol/L @ first postoperative Day (t -test, $p = 0.019$)

Conclusion: The use of the Burjeel NiR_ICG protocol resulted in a considerable reduction in inadvertent removal of the parathyroid gland during total thyroidectomy. Additionally, there was a significant correlation observed between the ICG score level obtained from the protocol and the postoperative parathormone level.