

# A Comparison Study of Transection Rate and Wound Surface Size Caused by a Manual and Motorized Sharp Punch in FUE

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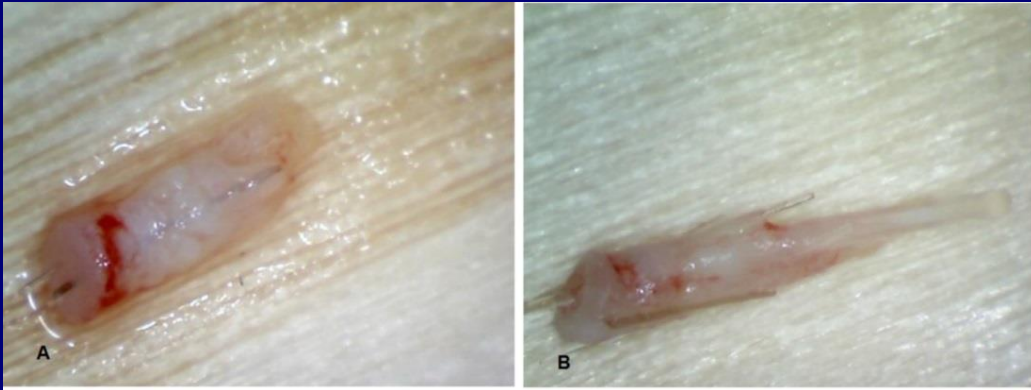
DISCLOSURES:

**The Speaker has no relevant financial relationships or conflicts of interest to declare.**

# Background

*Some of the main disadvantages of FUE:*

- *Time consuming*
- *Transection rate (partial – total)*
- *White dots on the donor area (hypopigmentation)*

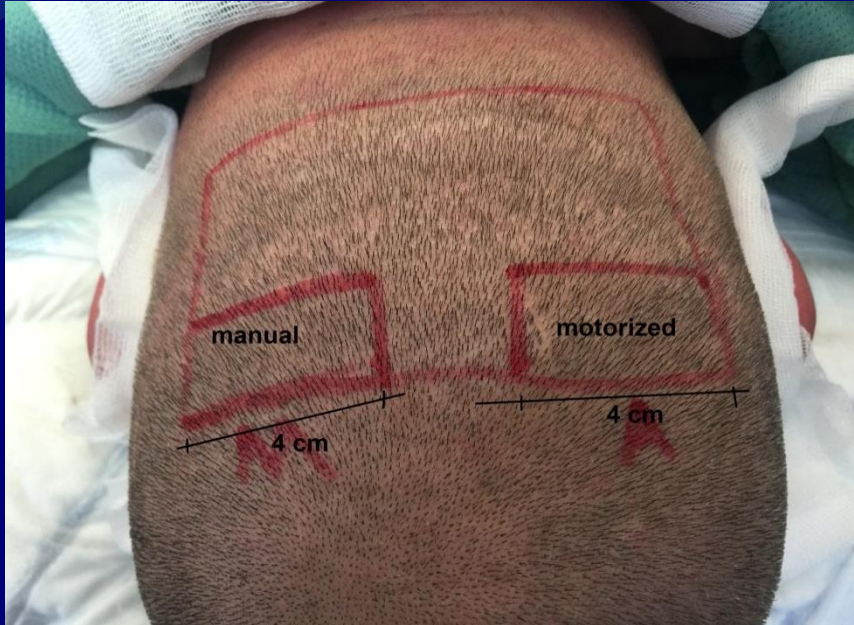


# Objectives

- 1) *Follicle transection rate*
- 2) *The average value of wound surface size*
- 3) *The mean value of follicles obtained per graft*
- 4) *The harvesting rate*
- 5) *Ultimately to evaluate the quality of the obtained grafts in both manual and motorized punch technique*

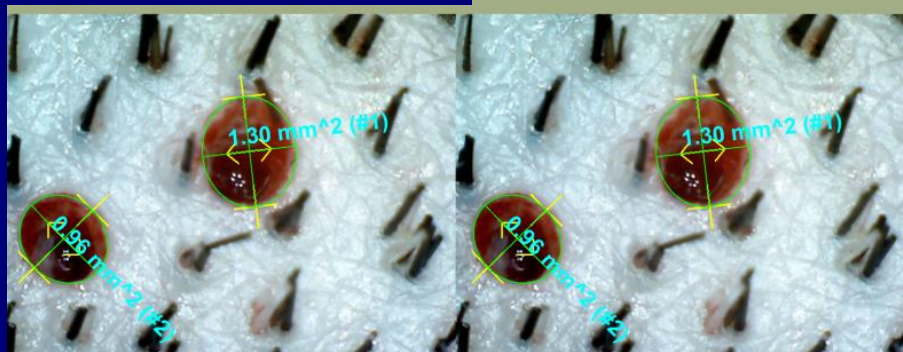
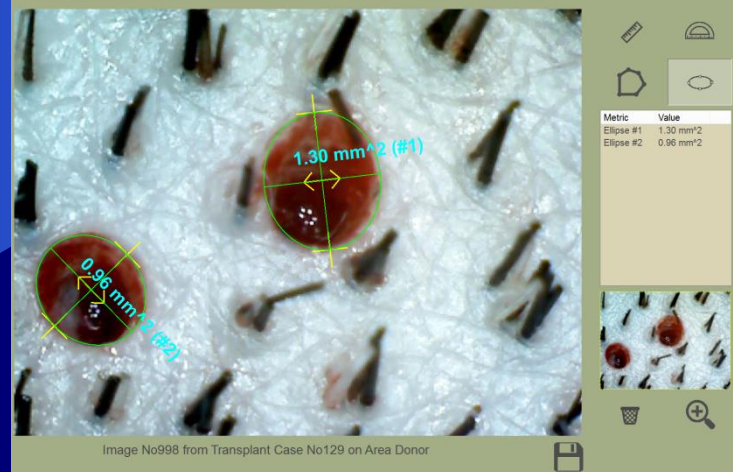
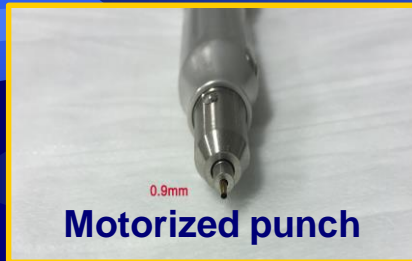
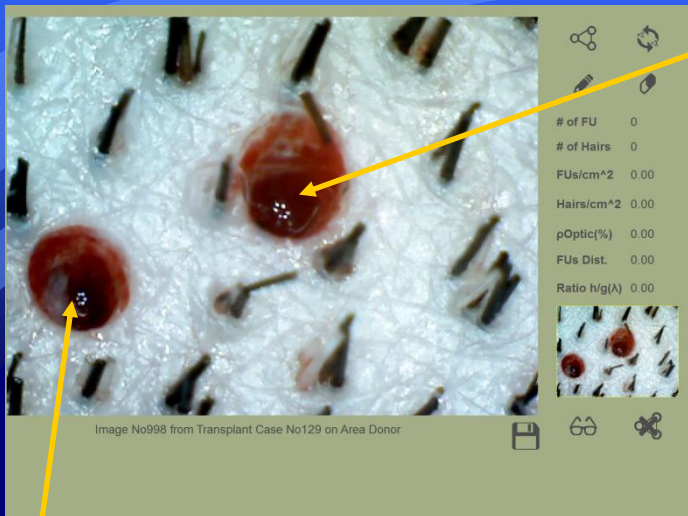
# Materials and Methods

- 23 patients
- 0.9 mm sharp punch for both manual and motorized technique
- Speed of rotation 15,000 – 17,000 rpm
- Two equal surface size rectangles (8 cm<sup>2</sup> ), were marked on the donor area
- Equal harvesting attempts made on each rectangle by using manual and motorized technique





# Observation

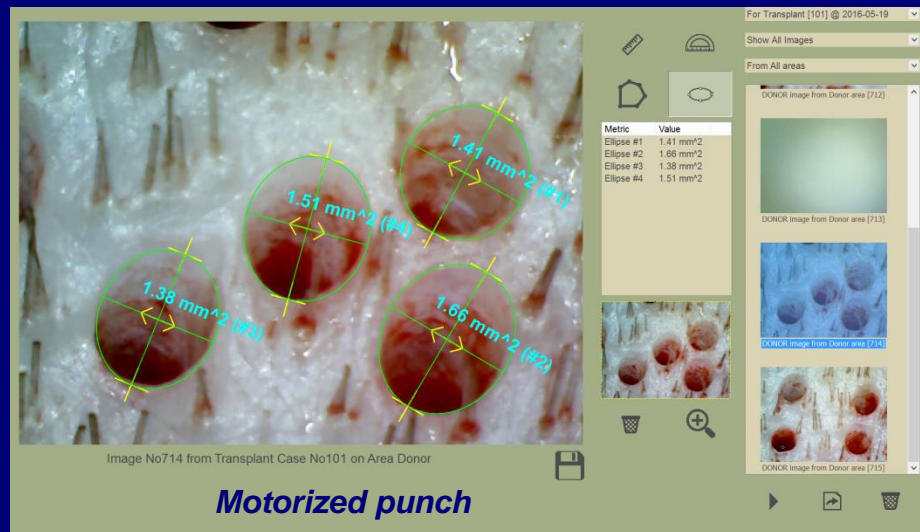
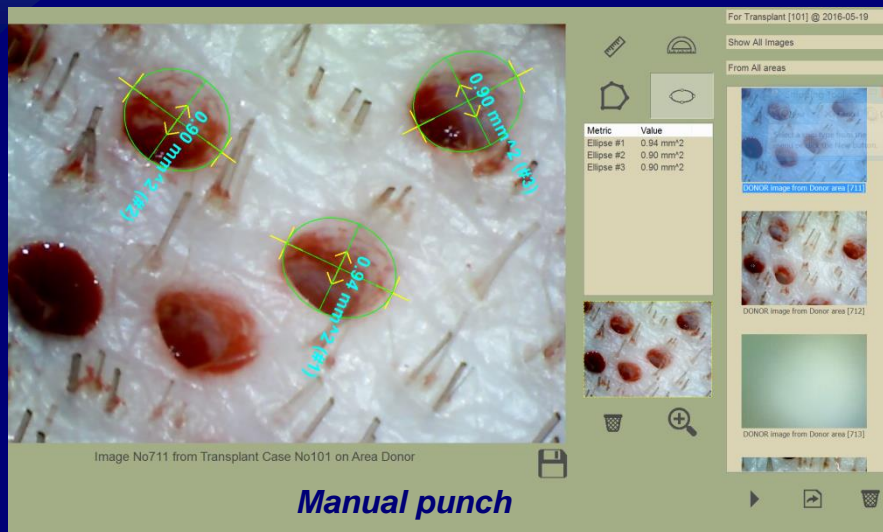


Ellipse #2 VS Ellipse #1, Value Difference: 0.34, Relative Difference: 35.42 %



# Measurements

- The surface size of wounds in each rectangle was measured using a proprietary image processing system
- The follicle transection rate  $n = \frac{\text{follicles transected}}{\text{total number of follicles}} \times 100\%$
- The value of  $\lambda = \text{number of follicles} / \text{number of grafts for each case}$
- The value of the extraction rate = number of grafts per minute in each case



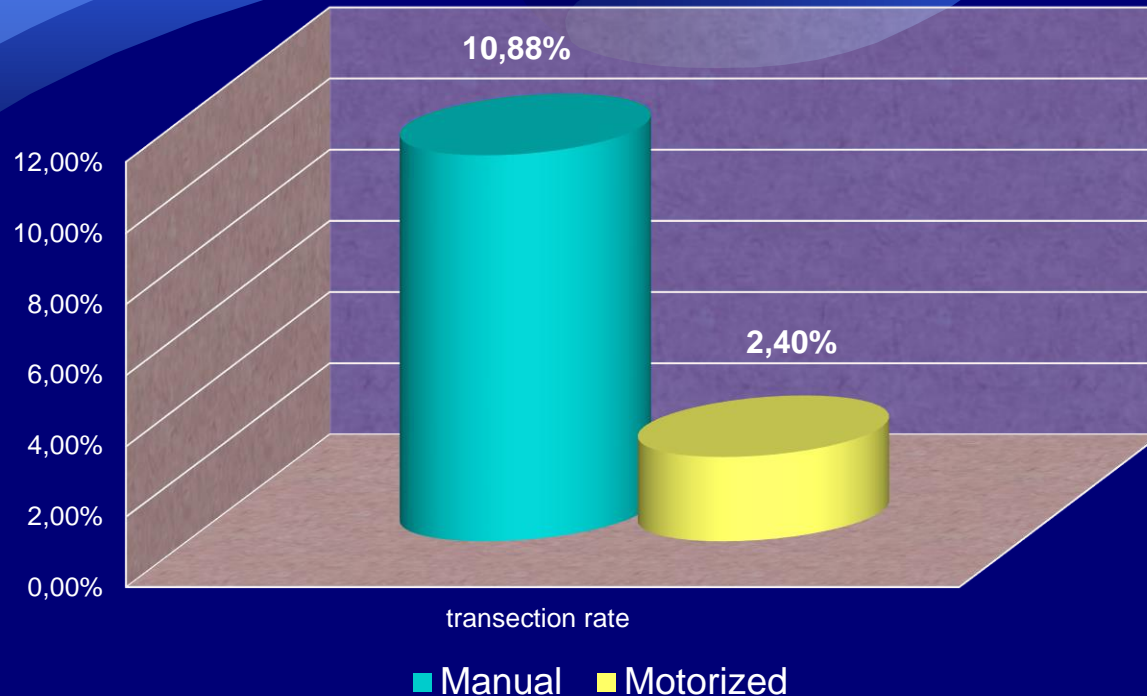
# Statistical analysis for both manual & motorized punch technique in 23 cases

- All the data analyzed by applying independent sample t-test and it was found that  $p=0.000<0.05$ . Because of this there is a statistically significant difference between the means with a 95% confidence interval of the difference.*

	Manual				Motorized			
	transection rate	Wound Surface (mm <sup>2</sup> )	Ratio $\lambda$	Extraction Rate (Grafts/min)	transection rate	Wound Surface (mm <sup>2</sup> )	Ratio $\lambda$	Extraction Rate (Grafts/min)
AVERAGE	10.88%	1.10	2.82	9.59	2.40%	1.48	3.18	13.15
Std. DEVIATION	6.36%	0.14	0.29	2.03	2.10%	0.15	0.37	1.90

# Statistical analysis for both manual & motorized punch technique in 23 cases

## Transection Rate

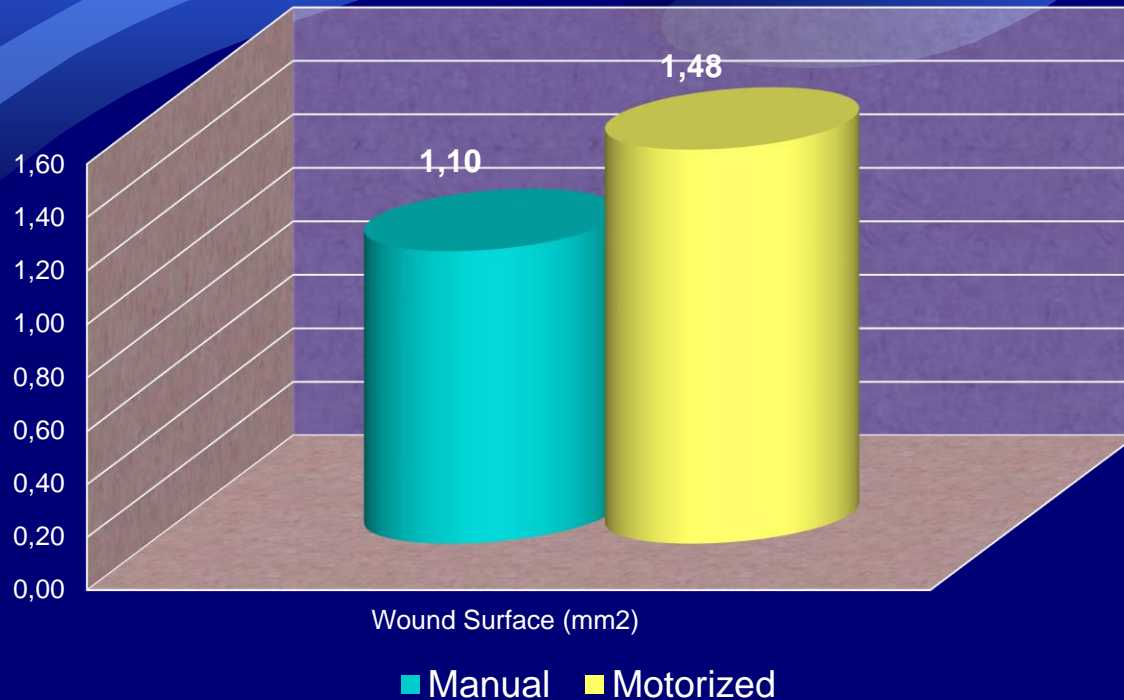


The transection rate using a motorized punch decreases by 77.94%.



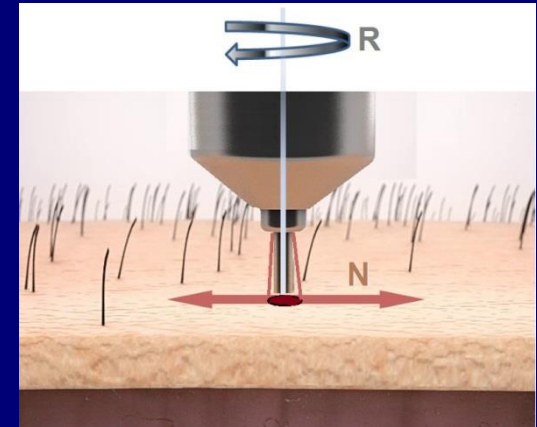
# Statistical analysis for both manual & motorized punch technique in 23 cases

## Wound Surface



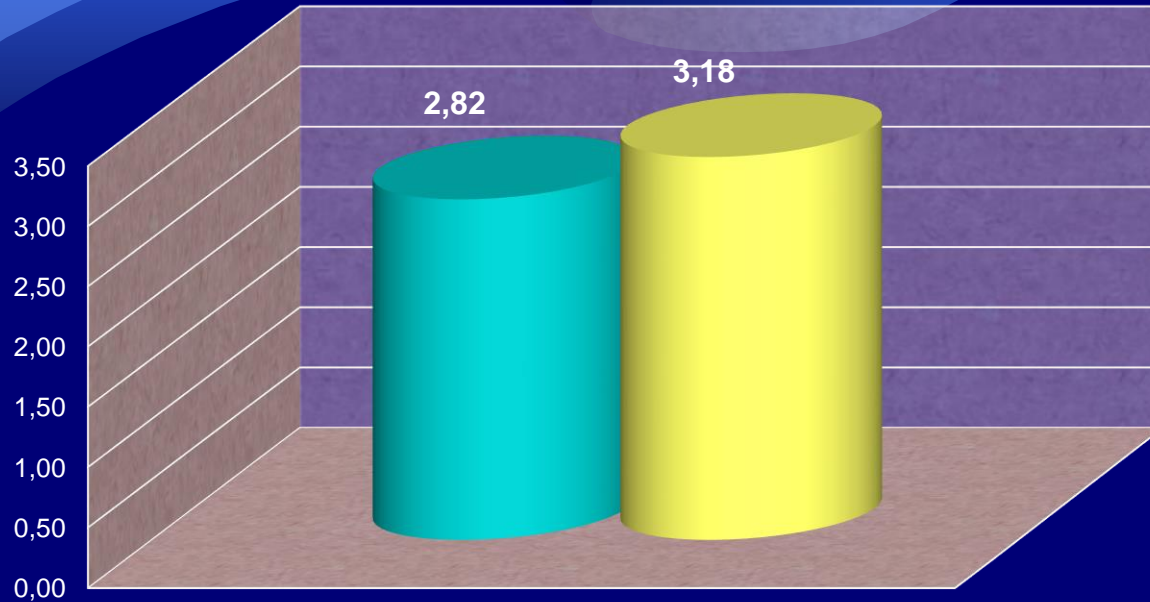
The injury to the donor area using a motorized punch increases by 34.55%.

This may be the resultant effect of the higher rotational motion of the punch and the **rotation** of the punch cylinder axis.



# Statistical analysis for both manual & motorized punch technique in 23 cases

Ratio  $\lambda$

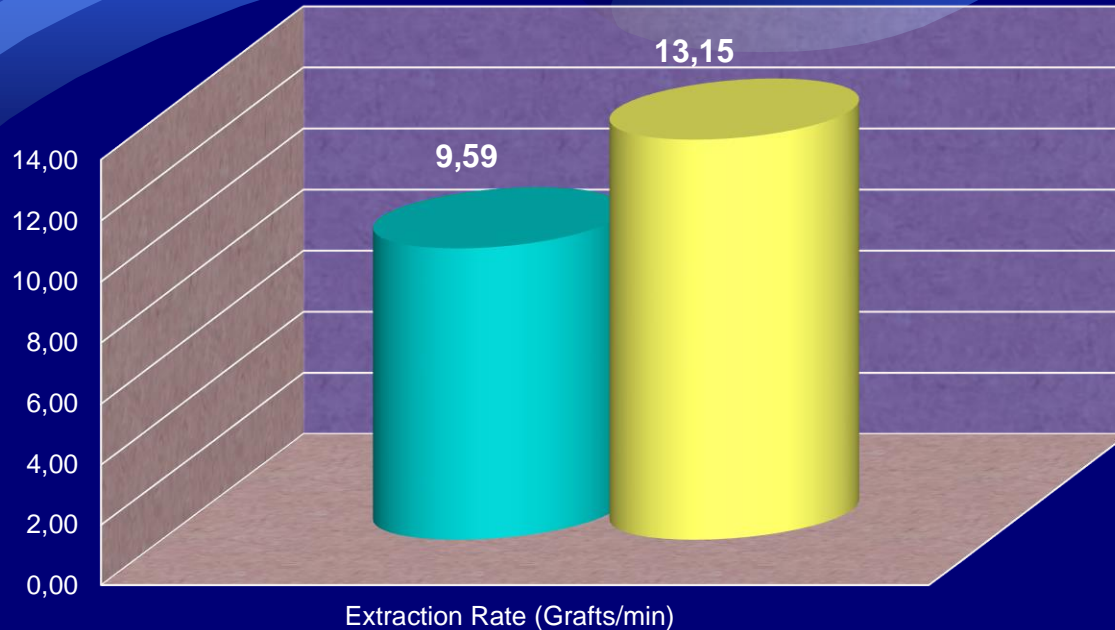


The ratio  $\lambda$  using a motorized punch increases by 12.77%.

■ Manual ■ Motorized

# Statistical analysis for both manual & motorized punch technique in 23 cases

## Extraction Rate



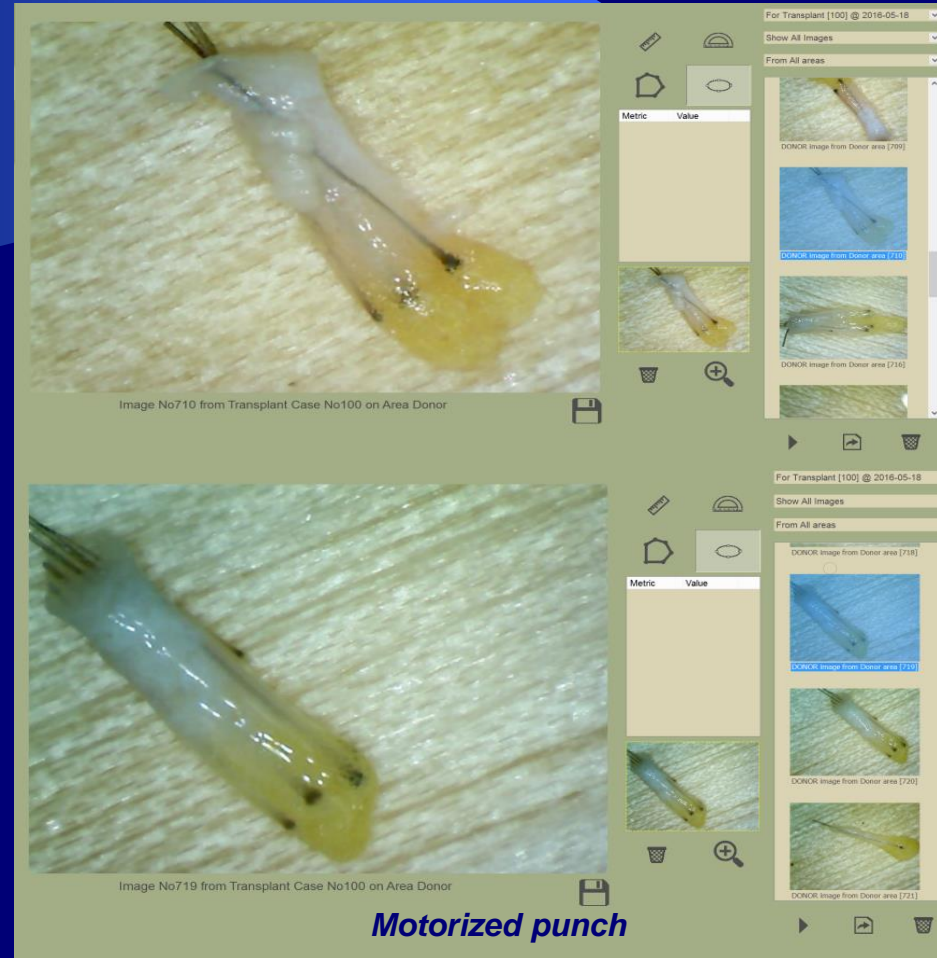
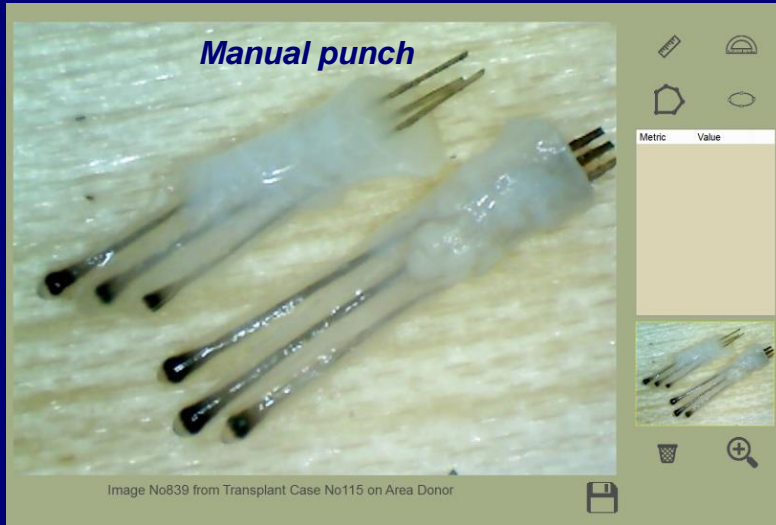
■ Manual ■ Motorized

The extraction rate using a motorized punch increases by 37.12%.

This in combination with the simultaneous decrease in the transection rate makes the harvesting process more efficient because more hairs are collected using the minimum harvesting attempts in a shorter period of time.

# Evaluation of the quality of the obtained grafts

*The motorized technique seems to be more efficient in producing better quality of grafts. Despite being generated by the same punch size, the grafts produced by the motorized punch appear to possess more protective tissue than those generated by the manual technique*





## Conclusion

*The motorized punch makes the FUE technique quicker and more efficient producing a larger number and better quality of grafts.*

*However, the larger wound trauma to the donor area increases the probability of noticeable scarring within the donor area.*

*Thank you for your attention!*