

# EFFECT OF A NEW ENHANCED FLUOROSCOPY TECHNOLOGY (VALVE ASSIST 2) ON OUTCOMES IN PATIENTS UNDERGOING TRANS-CATHETER AORTIC VALVULAR REPLACEMENT

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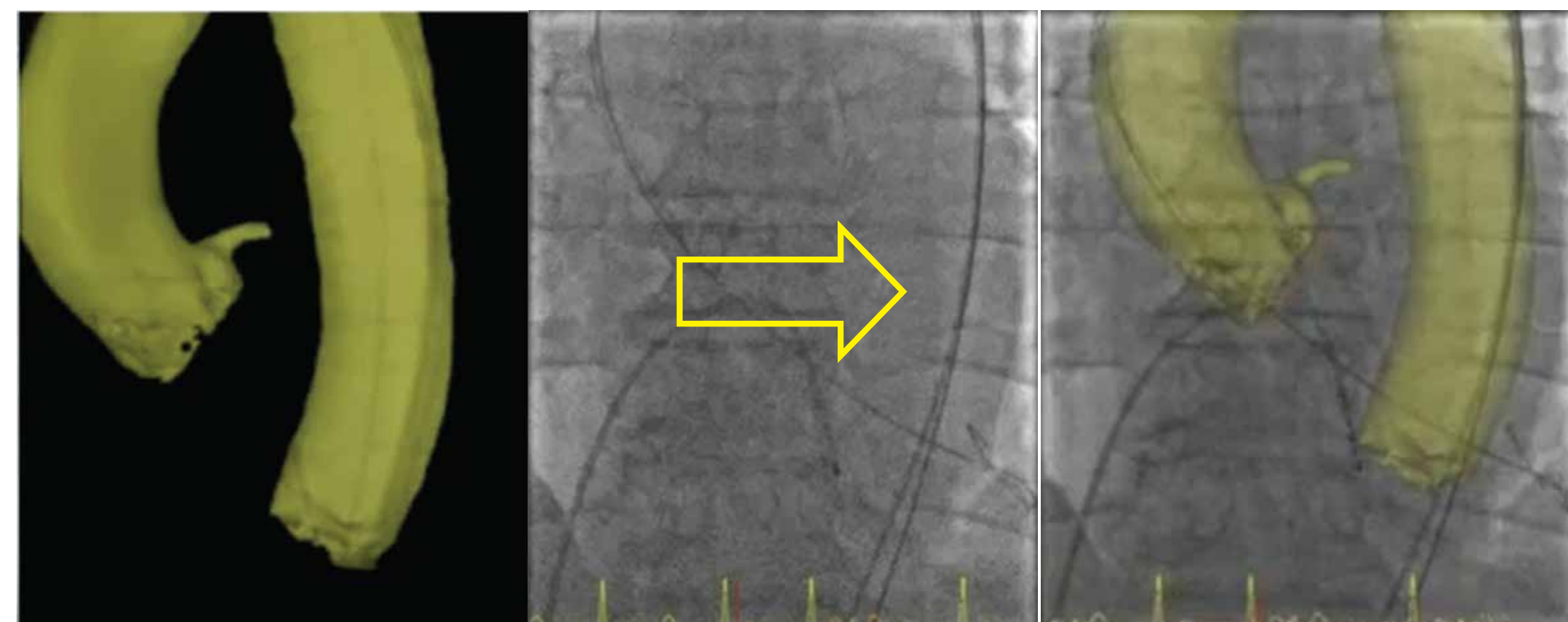
## PROBLEM

- Trans-catheter aortic valve replacement (TAVR) is the treatment of choice for high risk aortic stenosis (AS).
- An increased exposure to contrast, may increase risk for contrast-induced nephropathy (CIN).

## BACKGROUND

- GE Health has developed a new Fluoroscopy technology called Valve ASSIST 2 (VA2).
  - VA2 uses fusion imaging, merging data from preoperative CT Angiogram with live fluoroscopy (Figure 1).
  - VA2 enhances visualization of aortic valve calcification.
- An initial review of patients undergoing TAVR using the VA2 technology showed a decrease in the amount of contrast needed to complete the procedures.
- Post-TAVR para-valvular leak (PVL) still remains a hurdle that can lead to an increased mortality.

FIGURE 1



## OBJECTIVES

- To determine if:
  - VA2 technique is associated with a decrease in volume of contrast media, radiation dose and fluoroscopy time in patients undergoing TAVR.
  - A reduced amount of contrast use translate into a decrease in the rate of CIN.
  - In patients undergoing TAVR using VA2, is there an increase in the rate of PVL.

## METHODS

- This was an observational cohort study of patients undergoing TAVR:
  - Study group included 130 patients in whom VA2 was used.
  - The control group included patients who underwent TAVR using routine protocol between 7/1/2015 and 6/30/2016.

## METHODS

- Patients who had undergone valve-in-valve, transapical approach or who had end stage kidney disease and were on dialysis were excluded.
- Chi-square testing and independent T tests were used to compare categorical and interval data.
- ANCOVA was used to determine statistical difference for the amount of contrast use between groups adjusting for sex, age, history of coronary artery disease, chronic kidney disease and valvular disease.
- CIN was defined as an absolute increase in baseline serum creatinine by 0.5 mg/dL.

## RESULTS

- Baseline characteristics are in Table 1.
- There was a statistically significant difference in the amount of contrast, radiation dose and fluoroscopy time between VA2 group vs. the control group with  $p < 0.05$  (Figure 2).
- Using ANCOVA after adjusting for covariates, there remained a statistically significant difference in the amount of contrast used with  $F = 6.938$  and  $p < 0.001$ .
- There was no significant difference in the incidence of CIN (0.8% vs. 3.3%) (Figure 3) or PVL (5.6% vs. 7%) for VA2 versus control group.

FIGURE 2

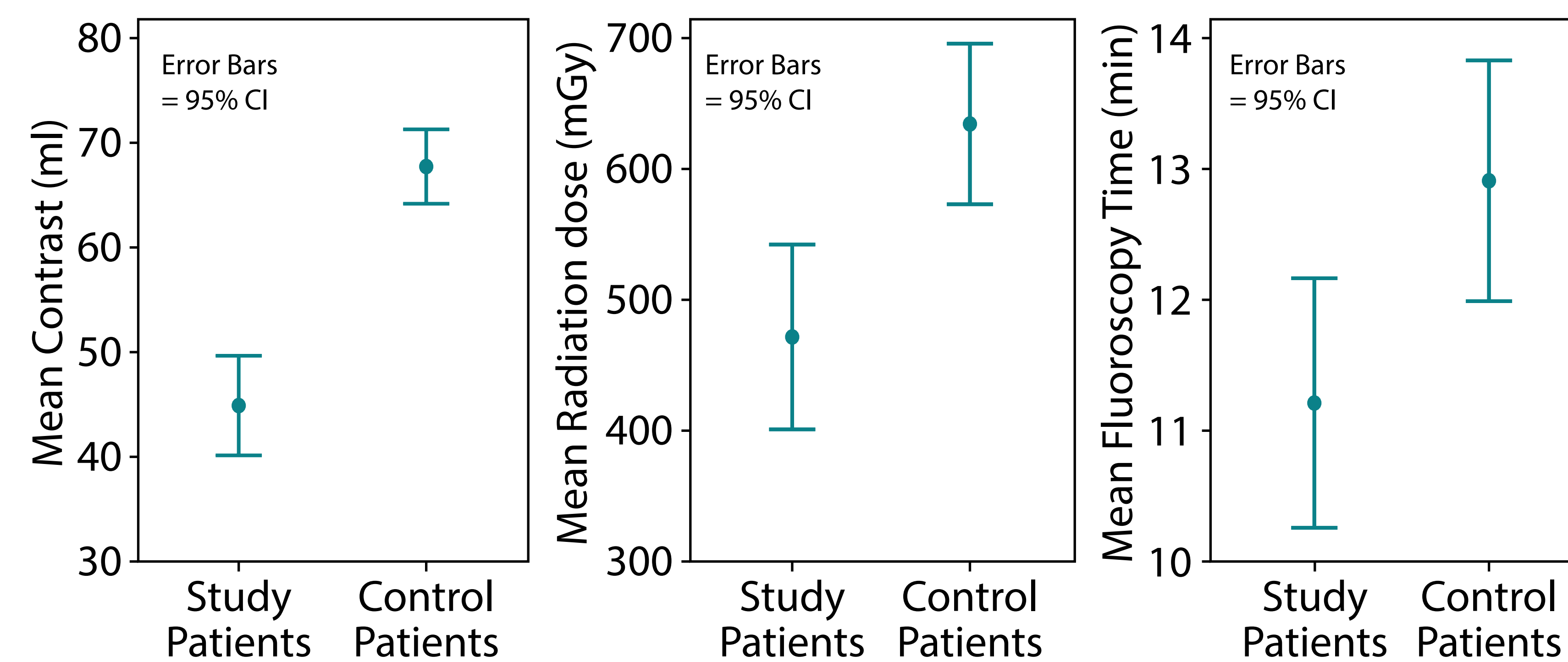
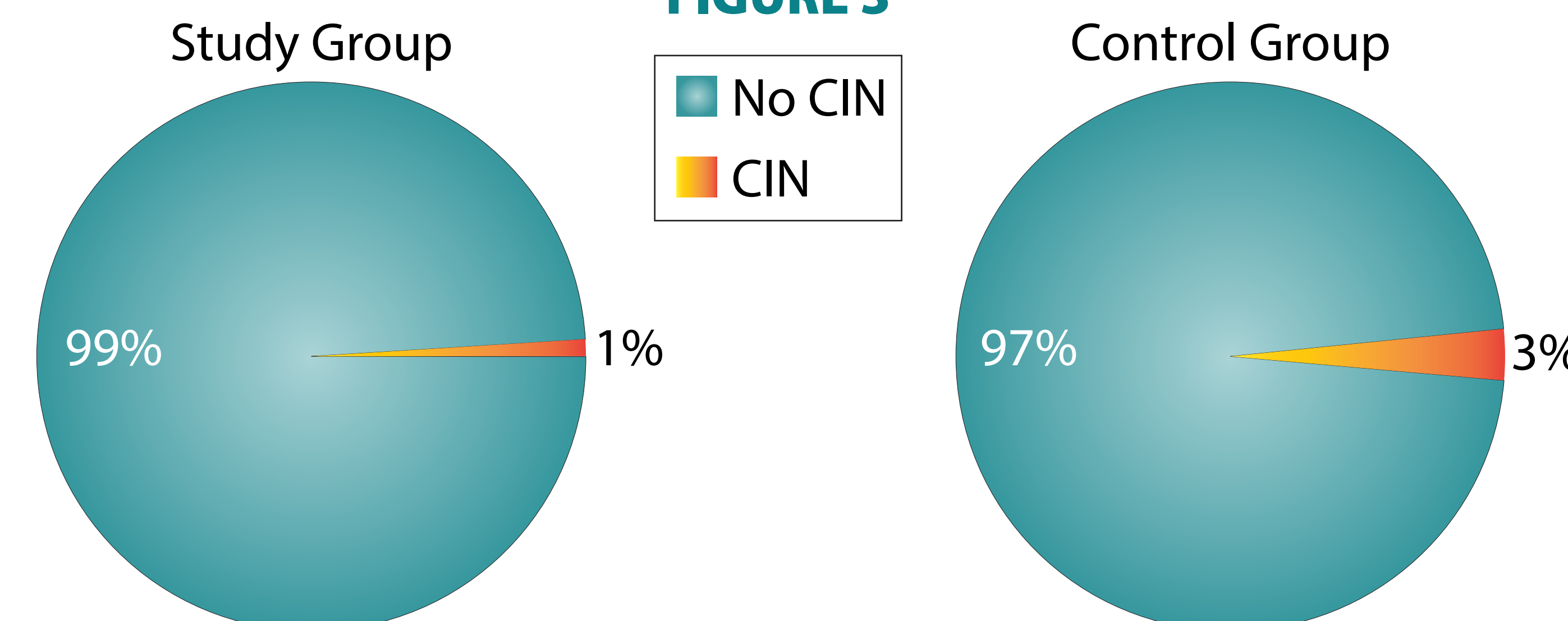


FIGURE 3



## RESULTS

TABLE: BASELINE CHARACTERISTICS

Variables	Study Group	Control Group	P-value
Age (yrs)	81 ± 8	83 ± 7	
Male	48%	44%	0.412
White	96%	97%	0.909
Hypertension	77%	80%	0.436
Coronary artery disease	66%	64%	0.719
Chronic kidney disease	36%	31%	0.375
Contrast (ml)	45 ± 26	67 ± 29	0.000
Radiation dose (mGy)	471 ± 398	634 ± 512	0.002
Fluoroscopy time (min)	11 ± 5	13 ± 8	0.026
PVL	5.6%	7%	0.610

## CONCLUSIONS

- The VA2 technology was associated with significant reduction in the amount of contrast dye as well as radiation dose and time for fluoroscopy.
- Although there was no significant difference in the incidence of CIN between the groups, the trend favored a reduction of CIN in the VA2 group.
- No increase in PVL was noted using the newer VA2 technology.

## REFERENCES

1. Smith CR, Leon MB, Mack MJ, et al. Transcatheter versus Surgical Aortic-Valve Replacement in High-Risk Patients. *New England Journal of Medicine*. 2011;364(23):2187-2198.
2. Madershahian N, Scherner M, Liakopoulos O, et al. Renal impairment and transapical aortic valve implantation: impact of contrast medium dose on kidney function and survival. *European journal of cardio-thoracic surgery: official journal of the European Association for Cardio-thoracic Surgery*. 2012;41(6):1225-1232.