The Image-Fusion using 2D-3D registration in TEVAR procedures

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Disclosure

I do not have any potential conflict of interest.

IF

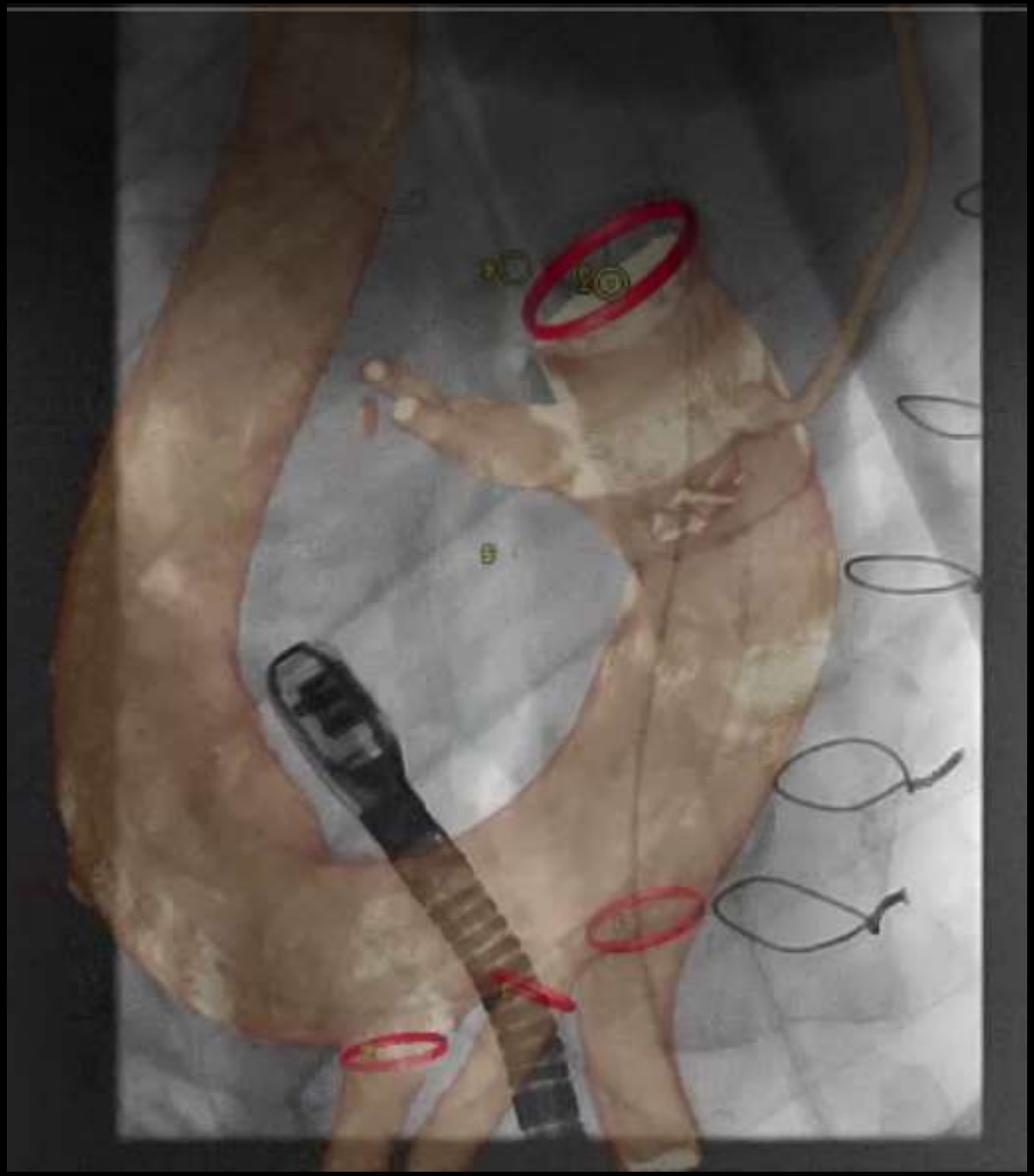
- The principle of image fusion (IF) is to produce a roadmap-overlay based on the preoperative CTA or MR and merge this overlay with the intraoperative fluoroscopic imaging.

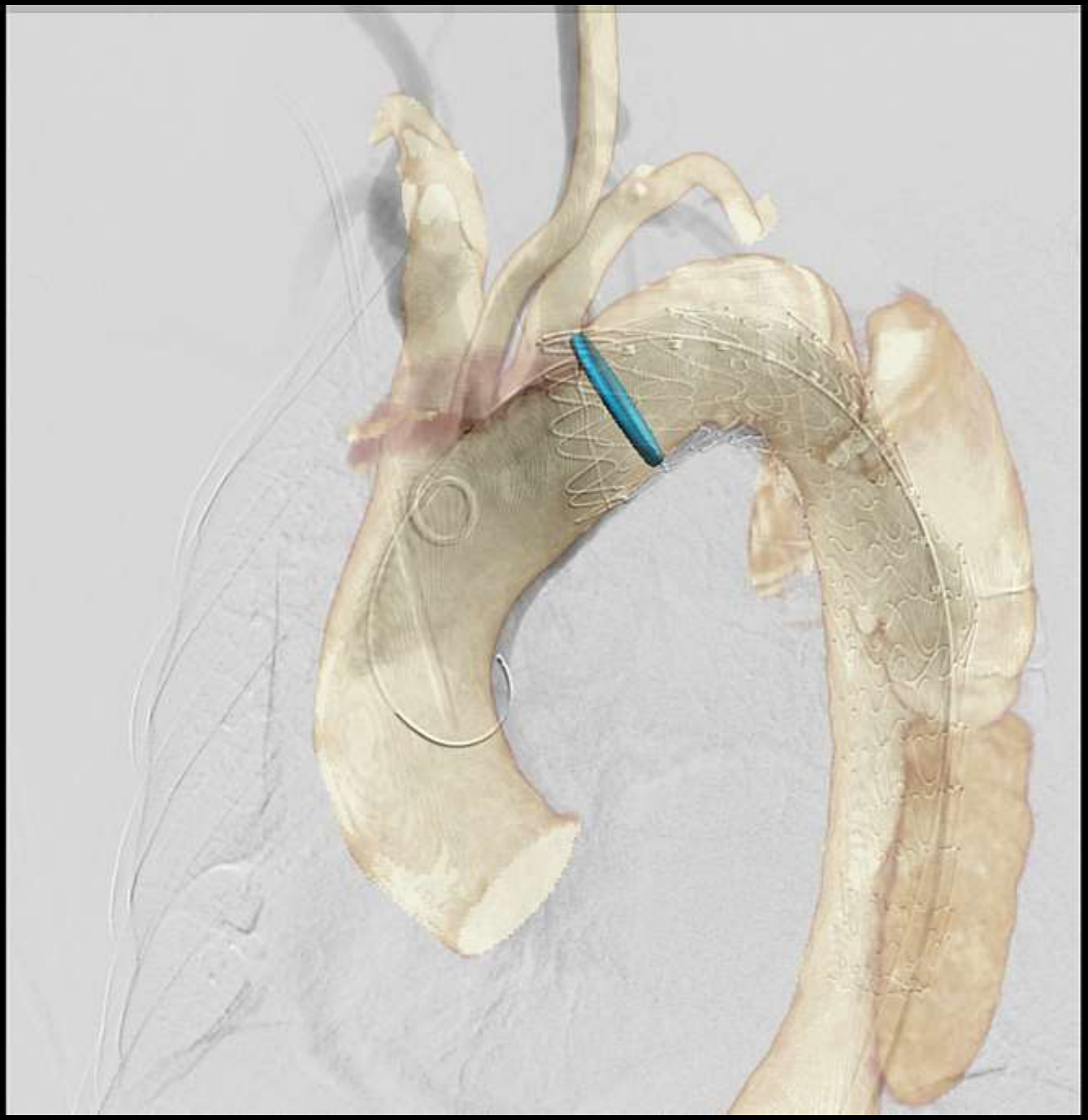
- This could be done in 2 ways; either as 2D-3D or as a 3D-3D registration.

Aim of Study

- Accuracy and effect of applying IF technology using the 2D-3D (based on 2 fluoro images) in patients undergoing TEVAR on the patient's:

- *radiation exposure (dose and time),*
- *amount of injected contrast medium needed*
- *as well as procedural time.*





Methods-Patients

- Between 2008-2016, 314 (146 included) patients underwent TEVAR.

- IF began March 2013.

Comparison:

- *IF vs.*
- *No-IF*

Results

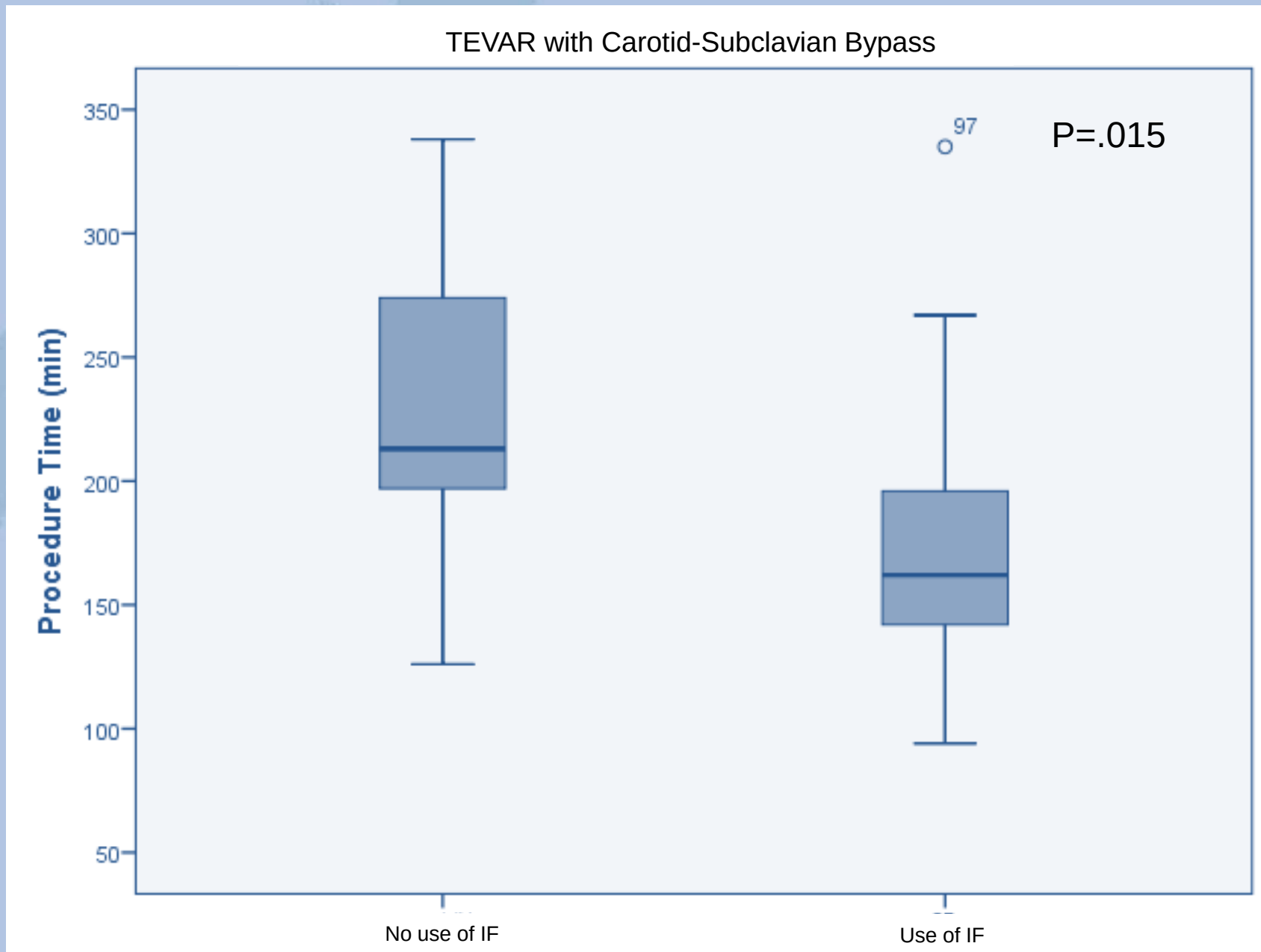
	IF	Controls	P-Value
Male/ Female	54/44	31/17	0.290*
Age (years)	72, IQR: 62-77	76.5, IQR: 61.5-83	0.036‡
BMI	25.2, IQR: 19.9-28.7	26.6, IQR: 23.8-31.3	0.263‡
Diameter of Aneurysm (mm)	62.5, IQR: 53.5-68.8	61.5, IQR: 55-70	0.952‡
Diabetes mellitus	11(11%)	7(14.6%)	0.402*
PAD	29(29.6%)	12(25%)	0.806*
CAD	40(42.9%)	20(41.7%)	0.912*
ATH	47(48%)	23(47.9%)	0.320*

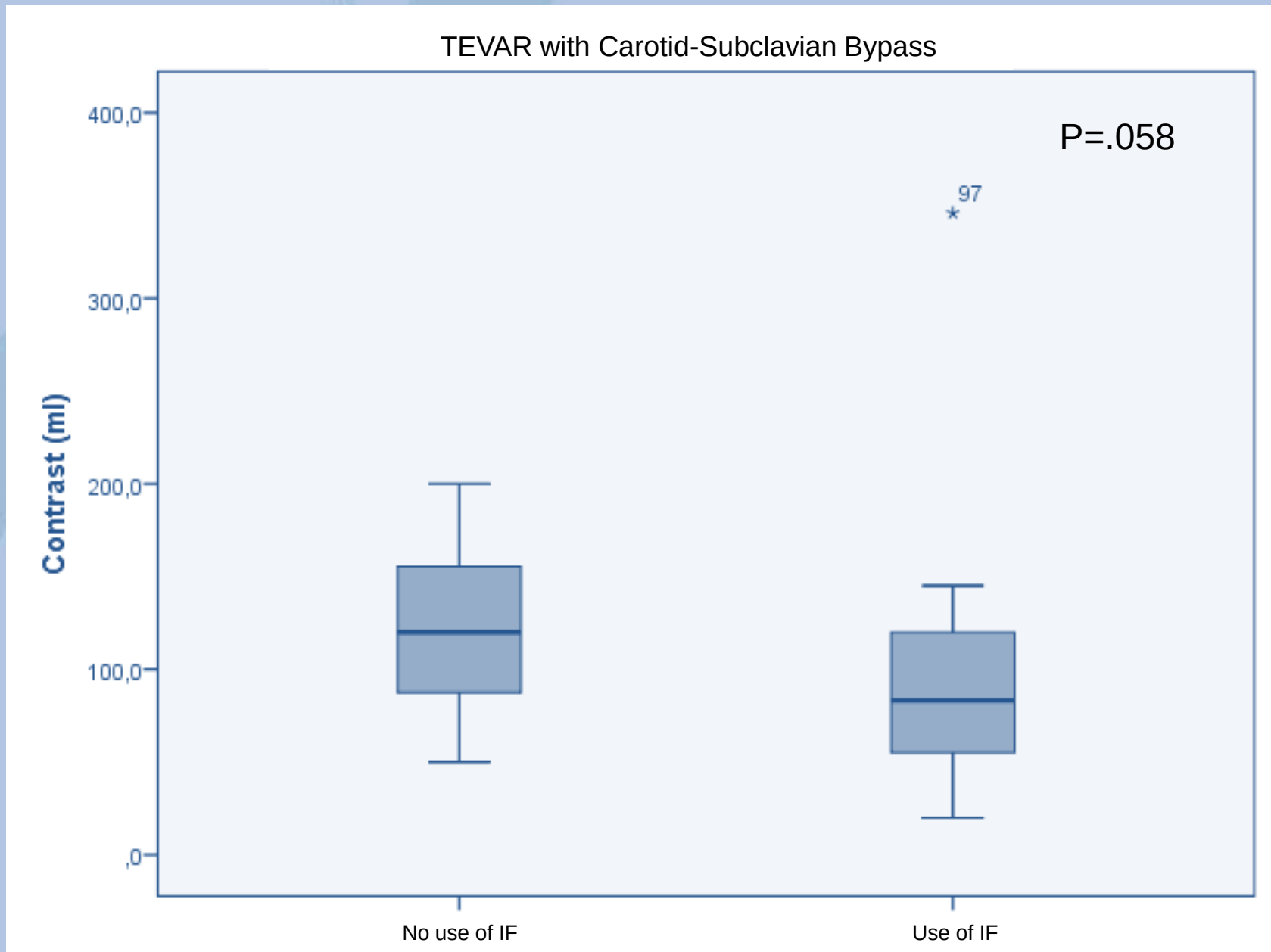
Results

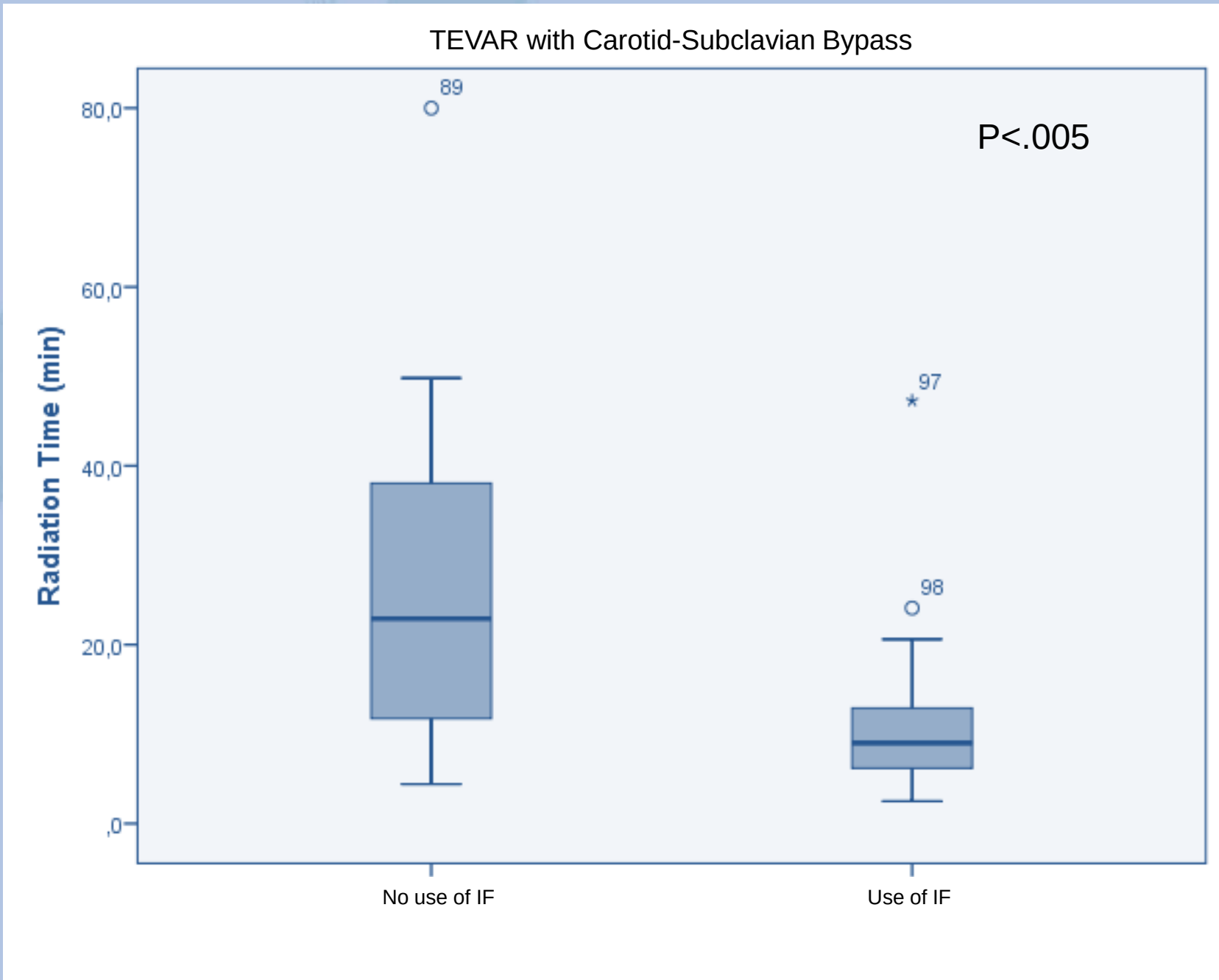
For the whole cohort (n= 146), there was a significant lower iodinated contrast medium use in the IF group in comparison to in controls. ($P<.001$)

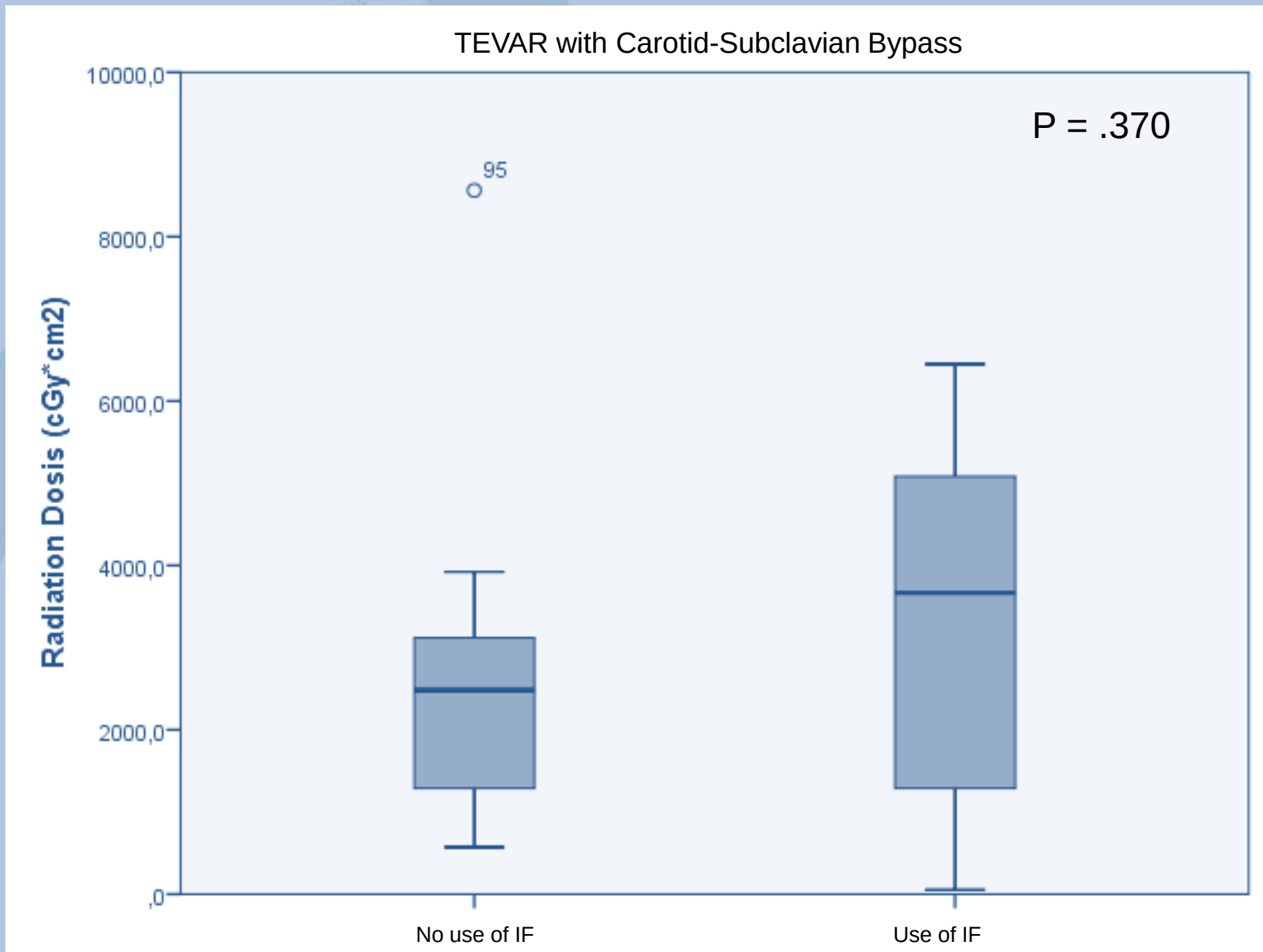
I- TEVAR with a carotid-subclavian artery bypass:

(26 Patients Vs. 11 Patients)


TEVAR with Carotid-Subclavian Bypass
Procedure Time (min)
350
300
250
200
150
100
50
97
P=.015
No use of IF
Use of IF

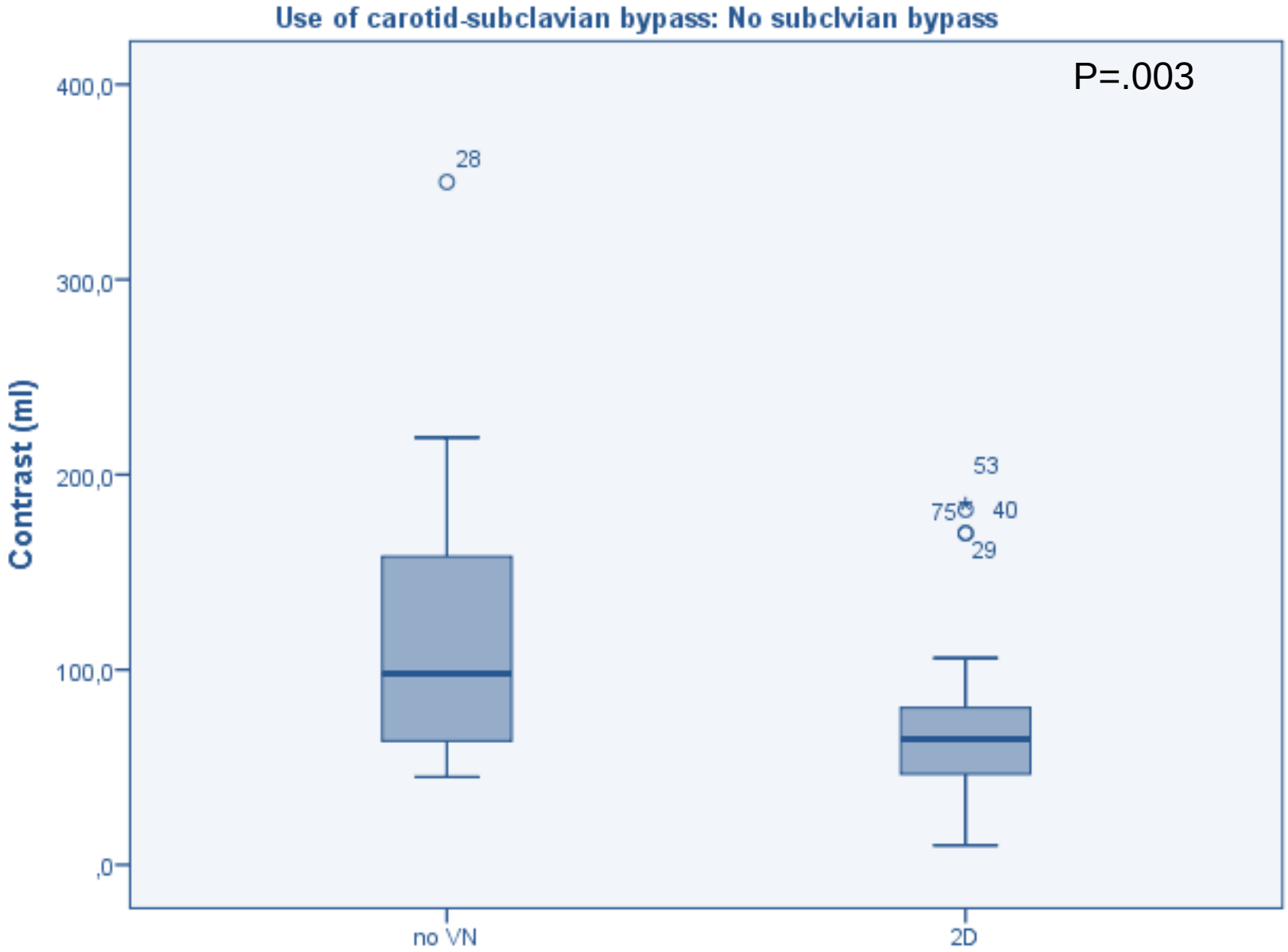

TEVAR with Carotid-Subclavian Bypass
P=.058
Contrast (ml)
400,0
300,0
200,0
100,0
,0
97
No use of IF
Use of IF

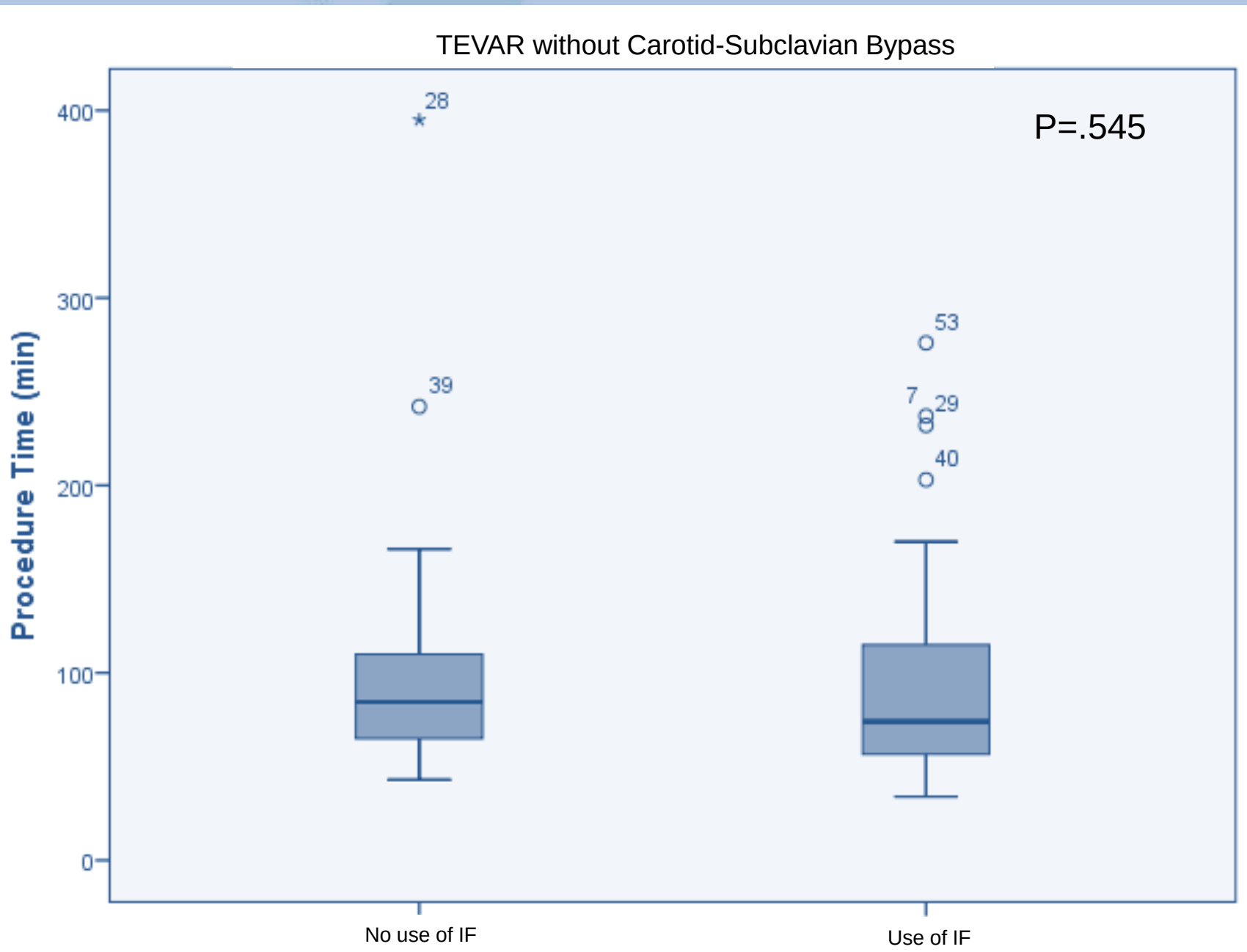

TEVAR with Carotid-Subclavian Bypass
P<.005
Radiation Time (min)
80,0
60,0
40,0
20,0
,0
89
97
98
No use of IF
Use of IF

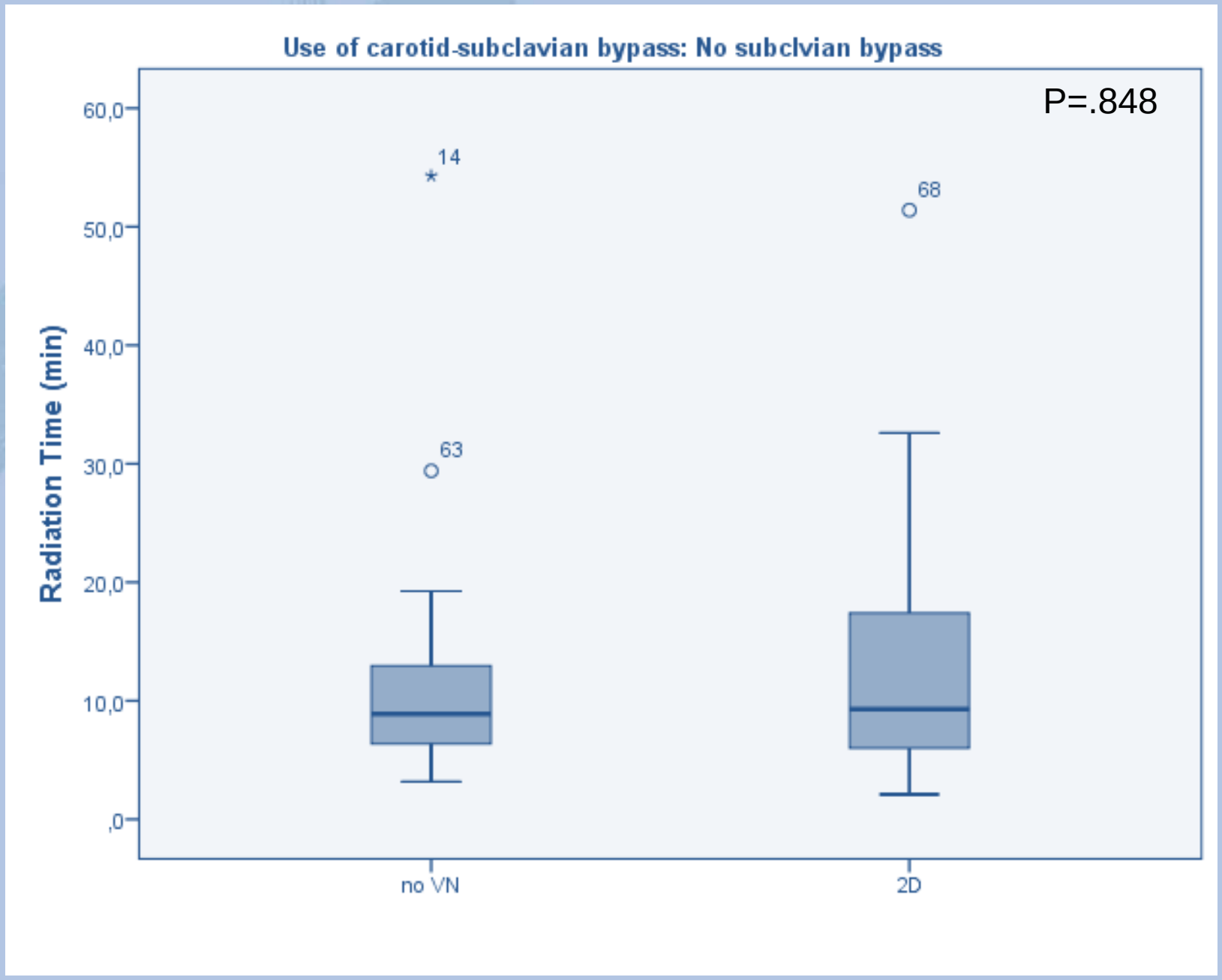

TEVAR with Carotid-Subclavian Bypass
P = .370
Radiation Dosis (cGy*cm2)
10000,0
8000,0
6000,0
4000,0
2000,0
,0
95
No use of IF
Use of IF

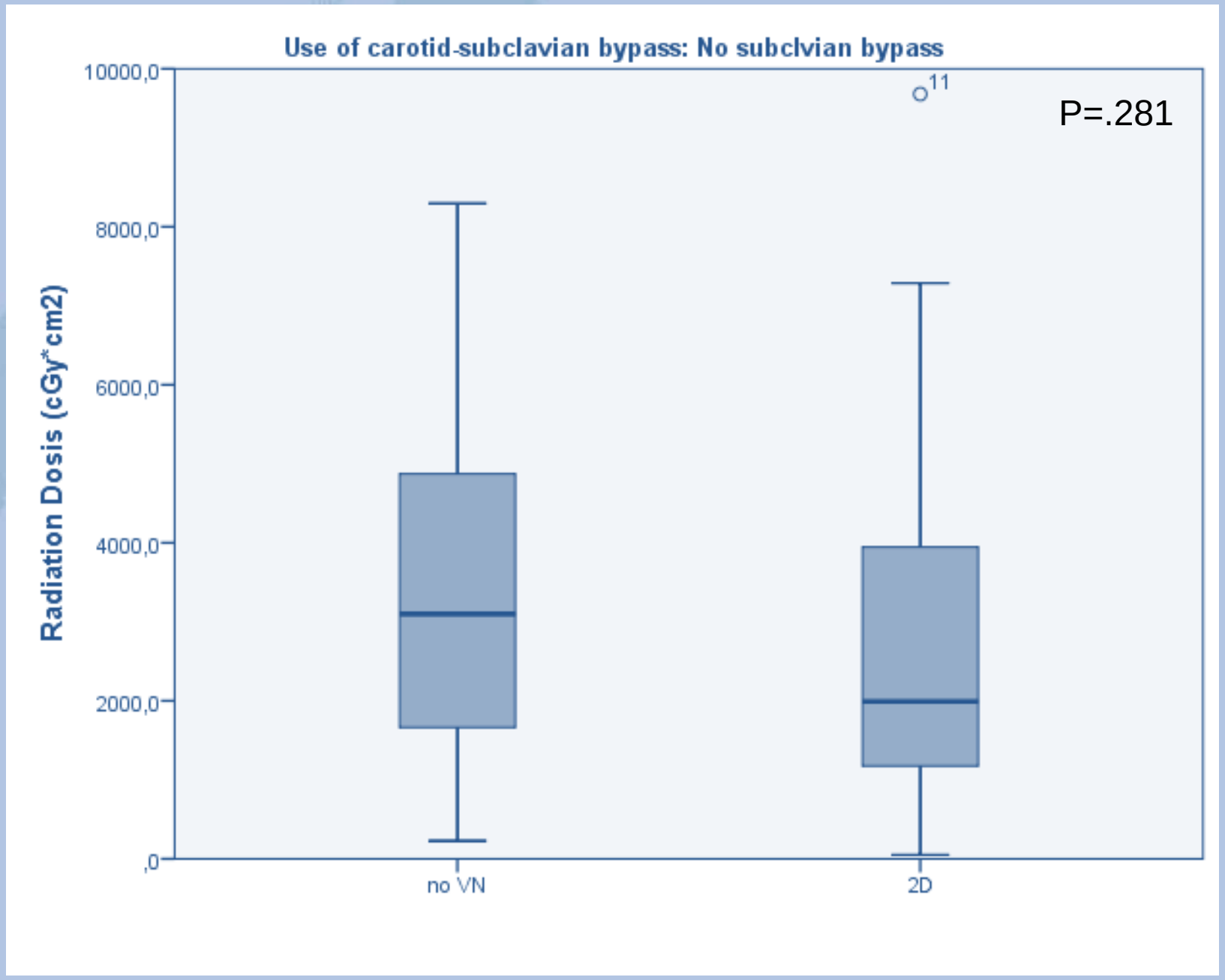
II- TEVAR without a carotid-subclavian artery bypass:

(44 Patients Vs. 30 Patients)


Use of carotid-subclavian bypass: No subclvian bypass
P=.003
Contrast (ml)
400,0
300,0
200,0
100,0
,0
28
53
75
40
29
no VN
2D


TEVAR without Carotid-Subclavian Bypass
P=.545
Procedure Time (min)
400
300
200
100
0
28
39
53
7
29
40
No use of IF
Use of IF


Use of carotid-subclavian bypass: No subclvian bypass
P=.848
Radiation Time (min)
60,0
50,0
40,0
30,0
20,0
10,0
,0
14
68
63
no VN
2D


Use of carotid-subclavian bypass: No subclvian bypass
Radiation Dosis (cGy*cm2)
10000,0
8000,0
6000,0
4000,0
2000,0
,0
11
P=.281
no VN
2D

Conclusion

- IF could reduce the amount of iodinated contrast medium.
- With carotid-subclavian bypass even with a significant reduction of fluoroscopic and procedural time.
- More experience and confidence with IF is needed.
- Larger and even more conform cohorts are needed.

Thank You for Your Attention

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