

Physician Estimated Depth: Can it Reduce Unnecessary CT Scan Evaluation of Pectus Excavatum?

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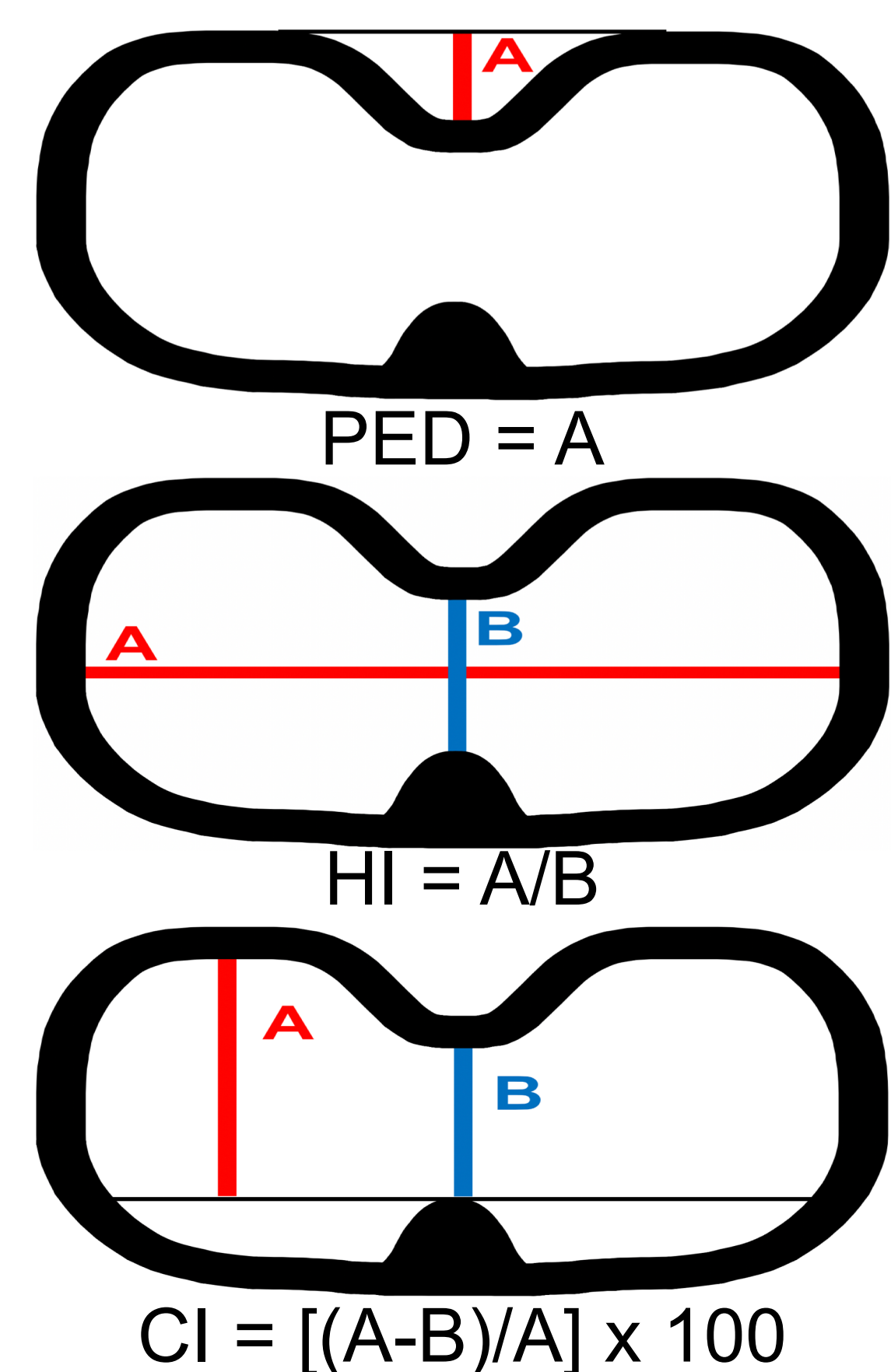
Background

- Pectus Excavatum (PE) is a chest wall deformity that affects 1/400 patients
- The severity is determined by by computed tomography (CT) derived indices such as the Haller Index (HI) and the Correction Index (CI)
- Physician estimated depth (PED) as an alternative measurement may preclude for CT
- This study retrospectively evaluated PED as a screening tool to identify surgical candidates

Methods

- Patients with a diagnosis of PE from 1/1/2009 to 3/30/2018 were extracted from the electronic health record for review
- Patients without available imaging were excluded
- HI and CI were calculated from CT images
- CT derived measurements acted as an approximation of PED
- Using ROC analysis, we estimated the optimal PED cut-off for identifying surgical candidates according to an HI ≥ 3.25

Figure 1. PED, HI, CI



Results

Figure 2. HI vs. CI

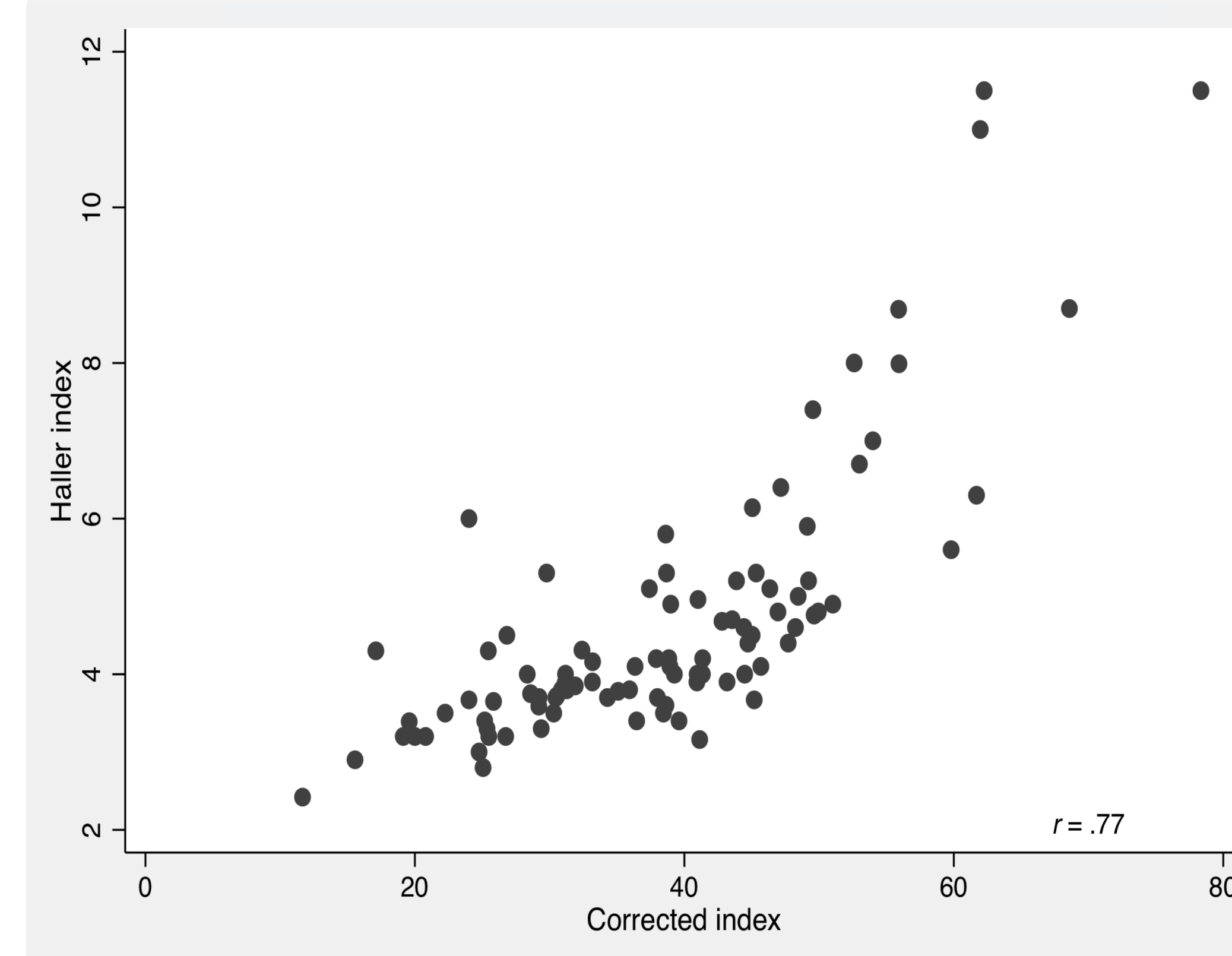


Figure 3. HI vs. PED

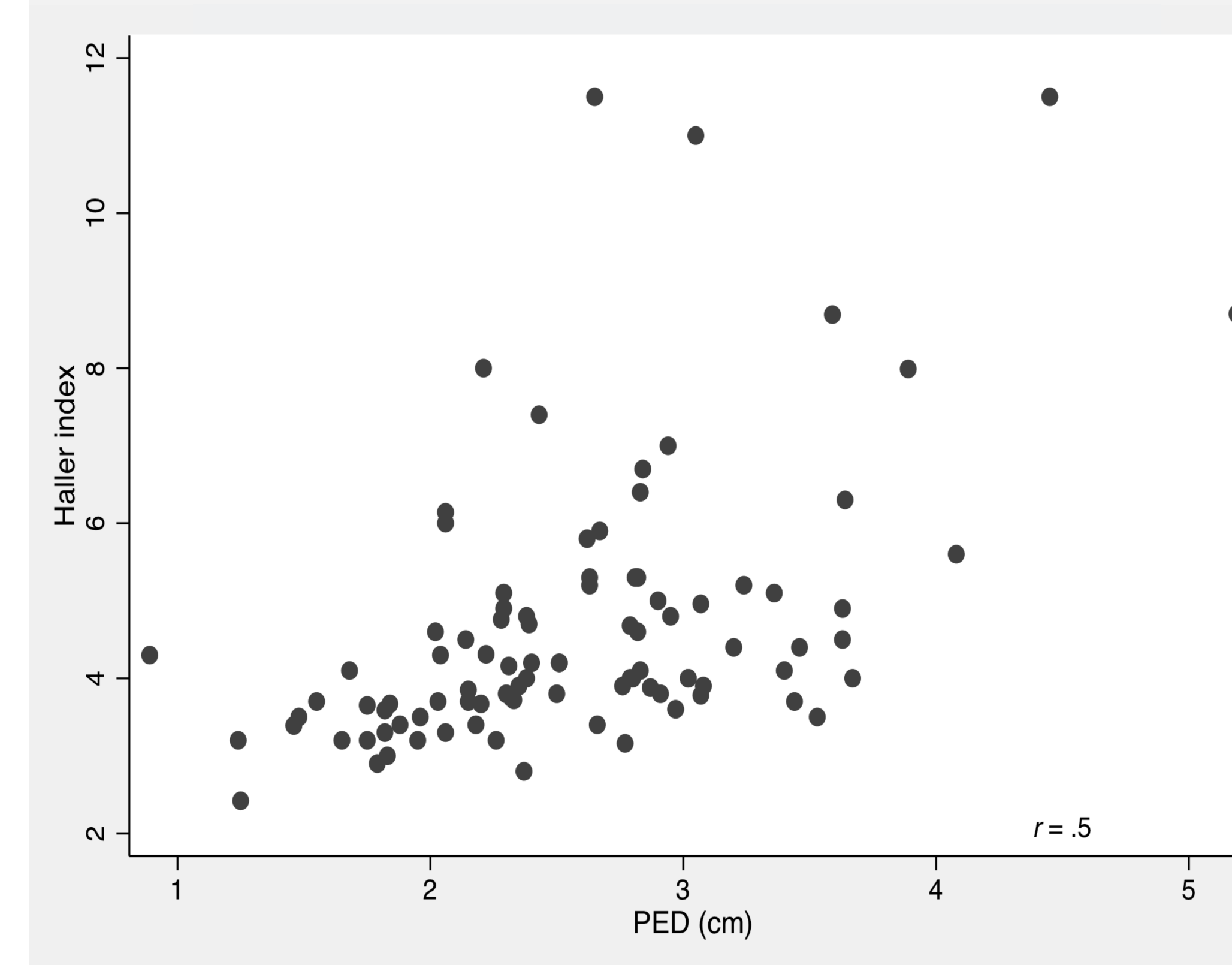


Figure 4. CI vs. PED

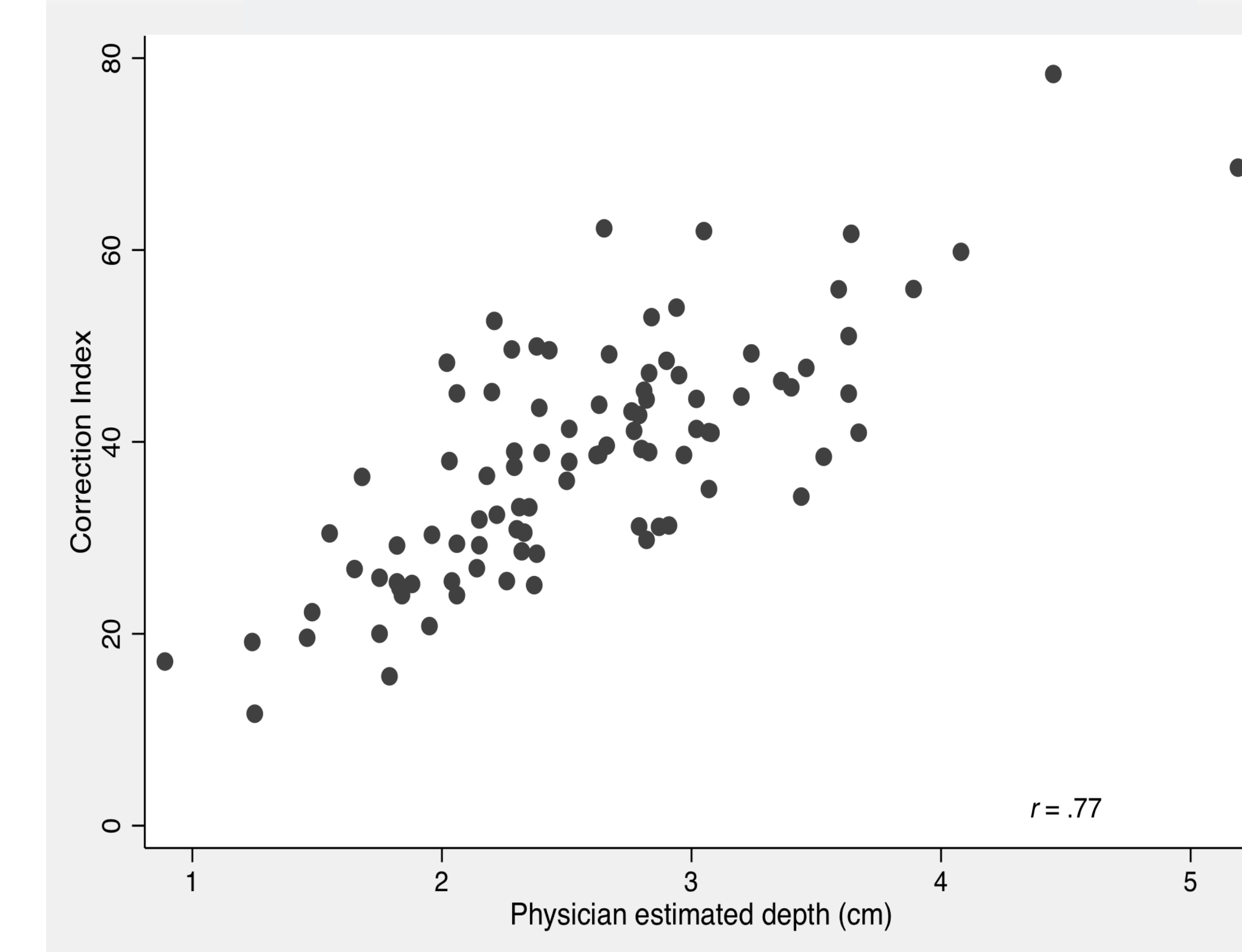


Figure 5. ROC HI 3.25 VS. PED 2 cm

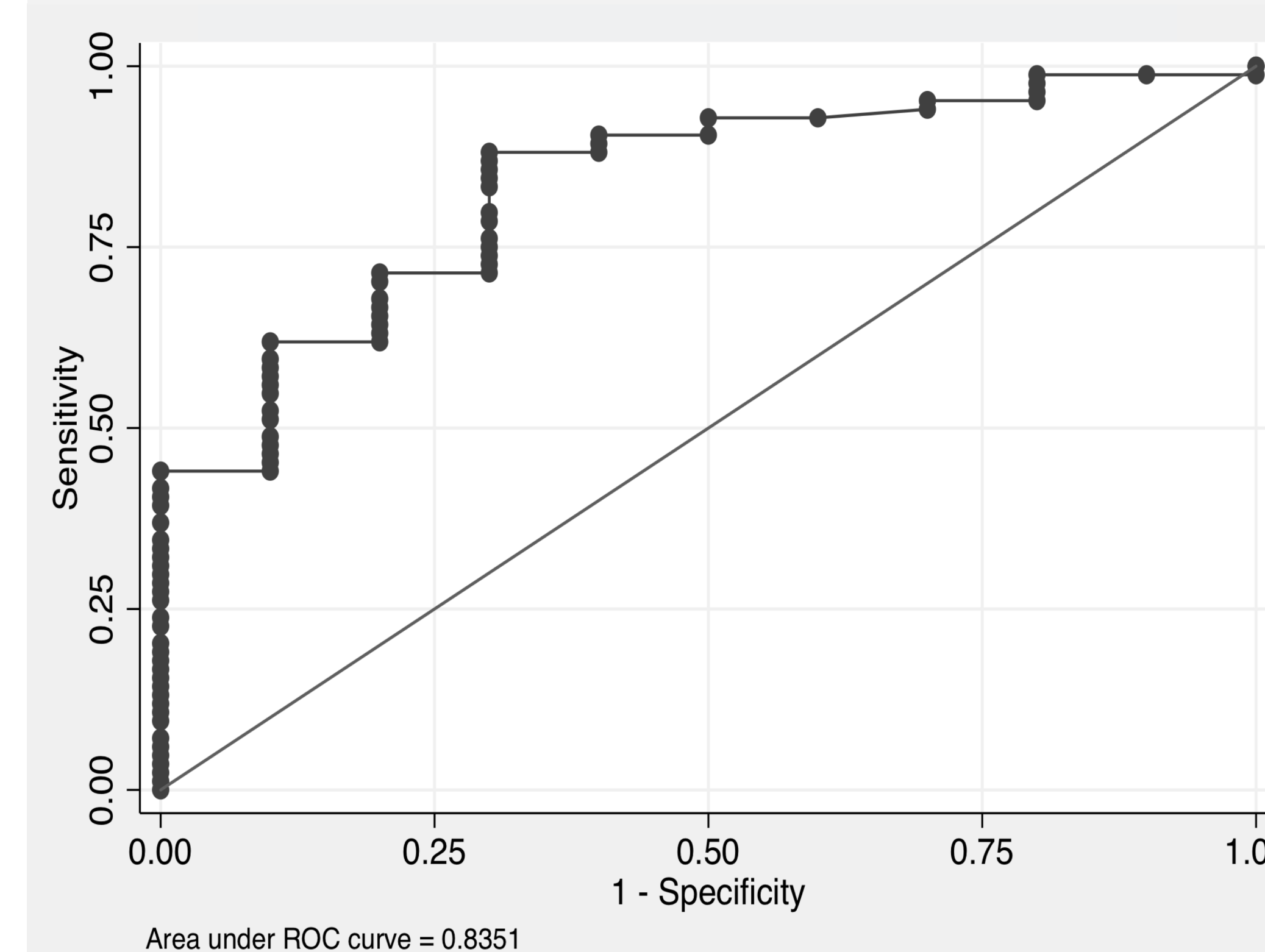


Figure 6. ROC CI 27 vs. PED 2 cm

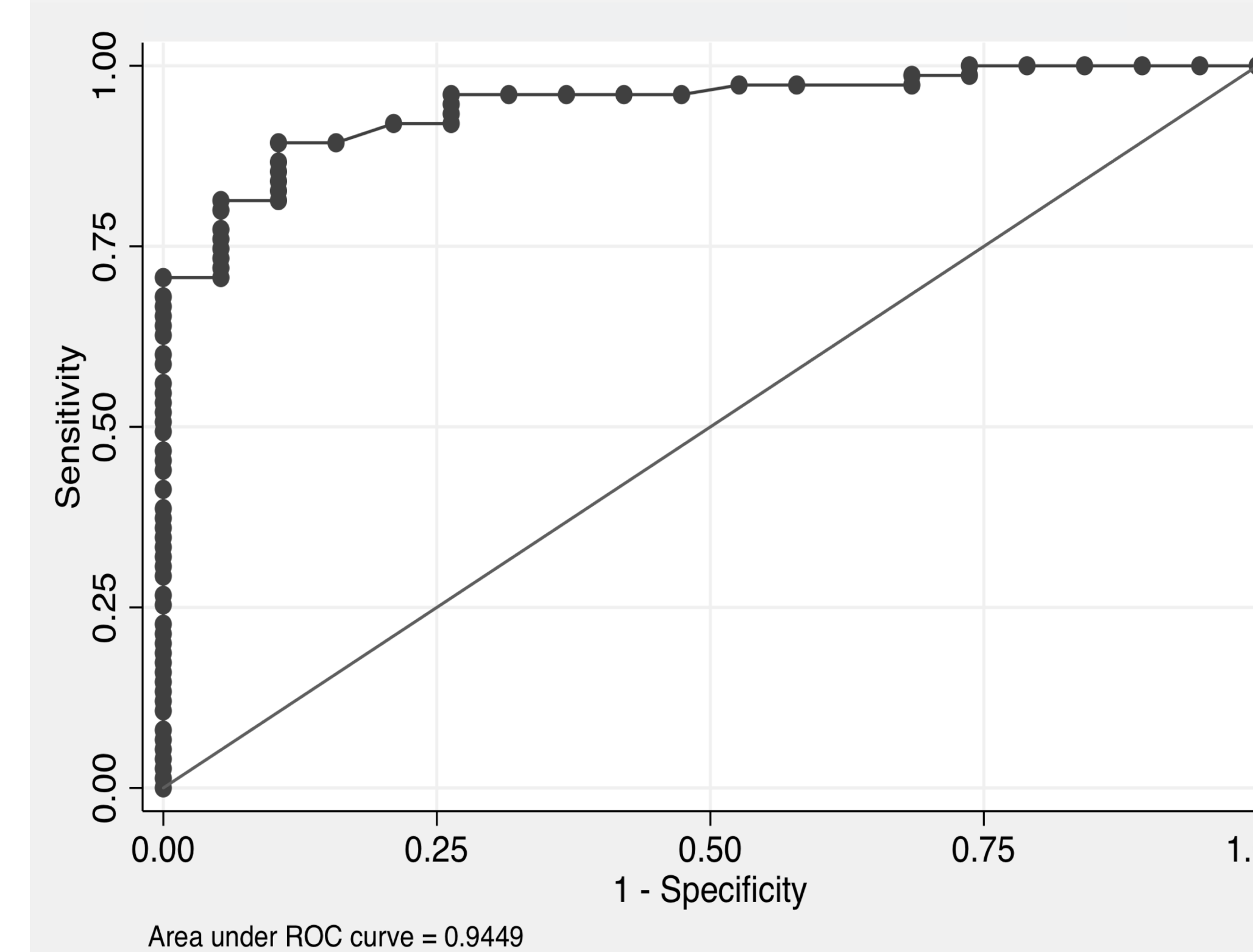
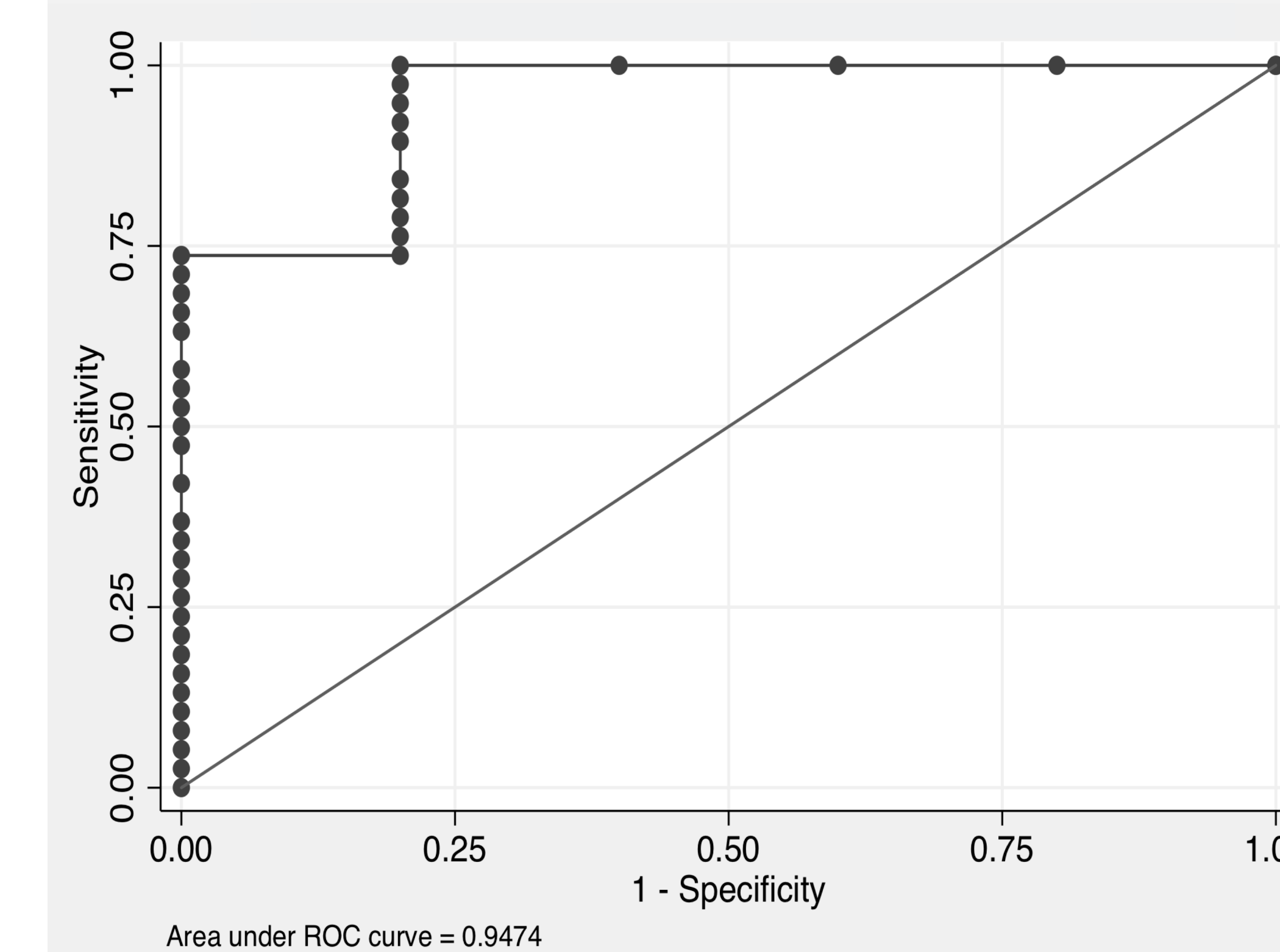


Figure 7. ROC CI 27 vs PED 2 cm, BMI < 18.5



Results

Table 1. Receiver Operator Characteristics

		AUC		Sensitivity	Specificity	Correctly classified
HI = 3.25 vs PED	All patients	0.84	PED = 2cm	88%	70%	86%
HI = 3.25 vs PED	BMI < 18.5	0.92	PED = 2cm	95%	75%	93%
	BMI > 18.5	0.75	PED = 2cm	82%	67%	80%
HI = 3.25 vs CI	All patients	0.91	CI = 27	89%	90%	89%
CI = 27 vs PED	All patients	0.94	PED = 2cm	96%	73%	91%
CI = 27 vs PED	BMI < 18.5	0.95	PED = 2cm	97%	80%	95%
	BMI > 18.5	0.93	PED = 2cm	95%	71%	88%

HI = Haller Index, CI = Correction index, PED = physician estimated depth, AUC = area under the curve

Conclusions

- PED over 2cm can accurately identify patients who require CT imaging and pectus correction
- Our findings show that PED may be employed easily in the clinic as a screening tool, thereby minimizing unnecessary CT scans
- A prospective evaluation of PED is underway at our center

Acknowledgements

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