

## 5.7 US vs CT for AAA

An abdominal aortic aneurysm is a dilation of the abdominal aorta. One of the dangers of this balloon-like dilation is that the aorta can catastrophically rupture (burst).

One of the strongest predictors of rupture is the size of the aneurysm; an accepted indication for surgical repair is a maximal aneurysm diameter larger than 50 to 55 mm (5.0 to 5.5 cm; about 2 inches).

Sprouse et al[1] compared the maximal diameter (in mm) of 334 abdominal aortic aneurysms as measured by CT ( $CT^{\max}$ ) and as measured by ultrasound ( $US^{\max}$ ). Figure 2 from the paper is reprinted below.

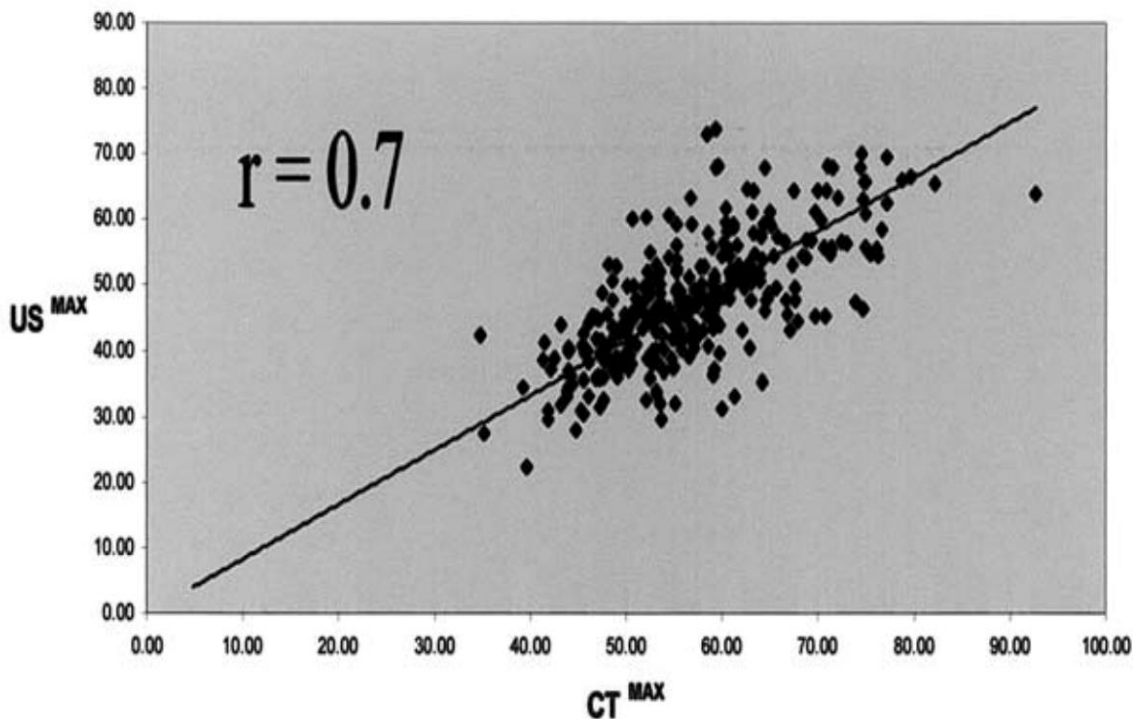


Fig 2. Correlation between  $CT^{\max}$  and  $US^{\max}$ . Reprinted from J Vasc Surg, 38(3):466-71, Sprouse LR, 2nd, Meier GH, 3rd, Lesar CJ, Demasi RJ, Sood J, Parent FN, et al. Comparison of abdominal aortic aneurysm diameter measurements obtained with ultrasound and computed tomography: Is there a difference? Copyright 2003, with permission from Elsevier.

a) Can you tell from this figure whether US measurements of AAA diameter tend to be higher than CT measurements, or lower?

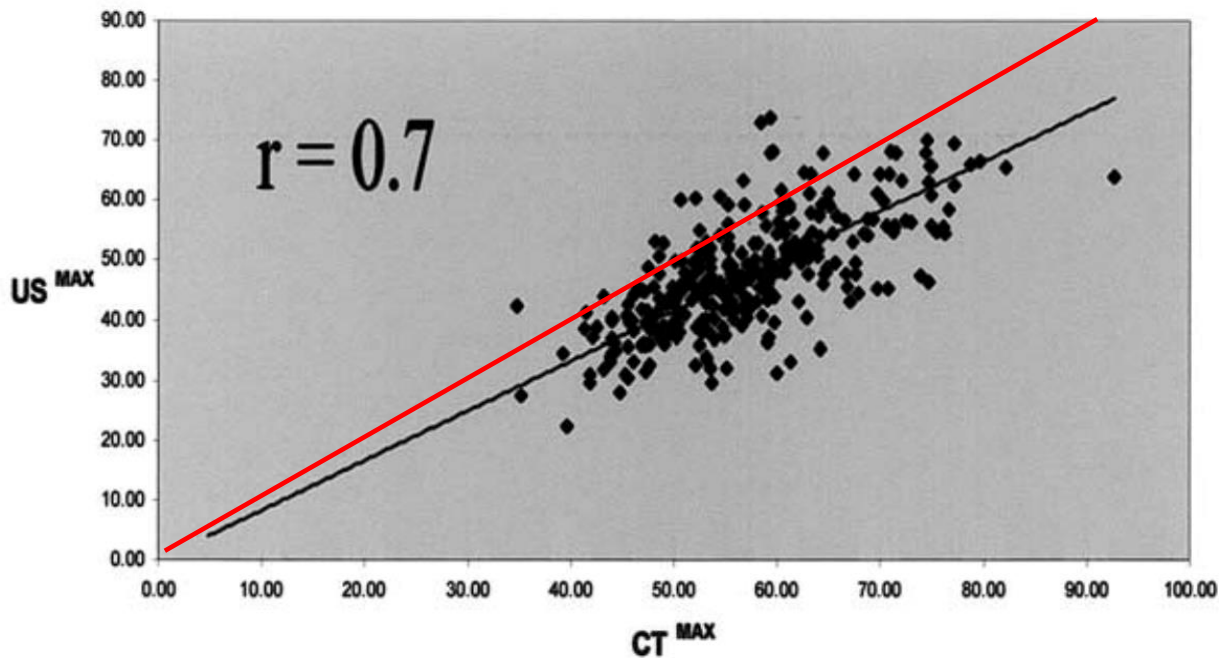


Fig 2. Correlation between  $CT^{\max}$  and  $US^{\max}$  with added line of identity. Original Figure 2 reprinted from J Vasc Surg, 38(3):466-71, Sprouse LR, 2nd, Meier GH, 3rd, Lesar CJ, Demasi RJ, Sood J, Parent FN, et al. Comparison of abdominal aortic aneurysm diameter measurements obtained with ultrasound and computed tomography: Is there a difference? Copyright 2003, with permission from Elsevier.

b) In the discussion of the results, the authors write:

“Although the difference between  $CT^{\max}$  and  $US^{\max}$  was statistically significant, the correlation (Fig 2) between  $CT^{\max}$  and  $US^{\max}$  in all groups was good (correlation coefficient, 0.705).”

If the goal is to determine whether clinicians can use  $CT^{\max}$  and  $US^{\max}$  interchangeably in the management of patients with AAA, is a “good” correlation sufficient? (Answer this part before doing the next part.)

c) Here is Figure 3 from the article:

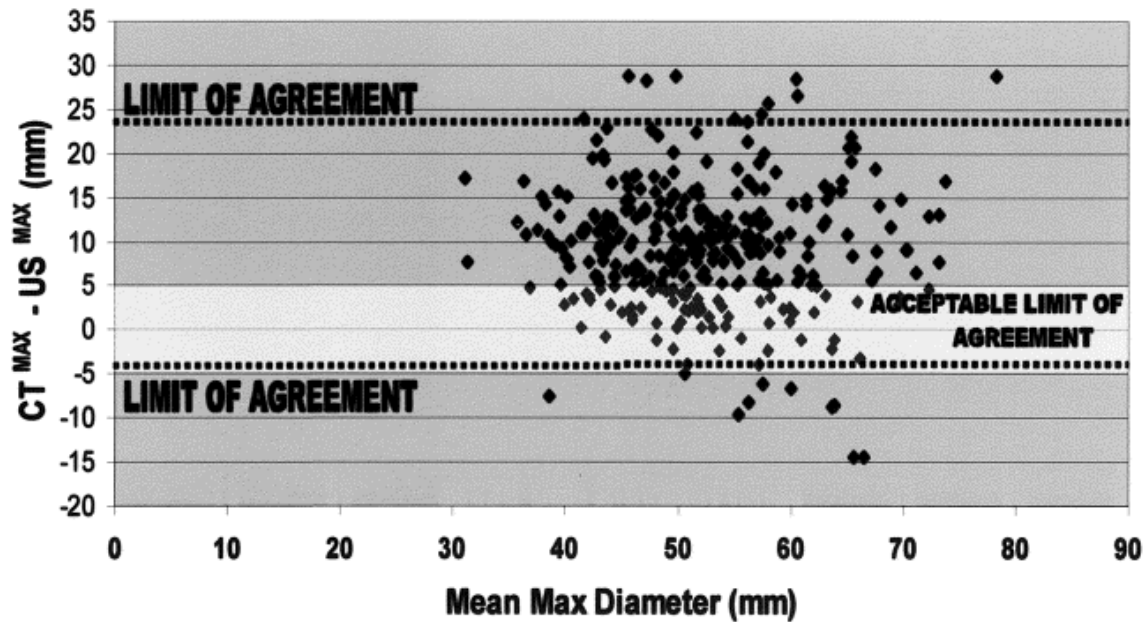


Fig 3. Limits of agreement (broken lines) between CTmax and USmax (-4.5-23.6 mm) compared with clinically acceptable limits of agreement (highlighted area) between CTmax and USmax (-5.0-5.0 mm). Reprinted from J Vasc Surg, 38(3):466-71, Sprouse LR, 2nd, Meier GH, 3rd, Lesar CJ, Demasi RJ, Sood J, Parent FN, et al. Comparison of abdominal aortic aneurysm diameter measurements obtained with ultrasound and computed tomography: Is there a difference? Copyright 2003, with permission from Elsevier.

What is the name of this type of graph?

d.) Based on Figure 3, does Ultrasound or CT tend to give higher AAA diameter measurements?

e) Can CT and US assessment of AAA be used interchangeably for purposes of deciding on operative intervention?

#### REFERENCE

1. Sprouse LR, 2nd, Meier GH, 3rd, Lesar CJ, Demasi RJ, Sood J, Parent FN, et al. Comparison of abdominal aortic aneurysm diameter measurements obtained with ultrasound and computed tomography: Is there a difference? J Vasc Surg. 2003;38(3):466-71; discussion 71-2.