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## Cardiac Ultrasound Clinical Case Study

# The unusual case of Aortic Dissection: Precision imaging with Aplio i-series

Type B Aortic Dissection identified with Aplio i-series 900 CV system

### Introduction

This case follows a young patient who presented through the Emergency department with sudden and excruciating chest pain. The transthoracic echocardiogram was otherwise normal, until the closing suprasternal view, where a Stanford Type B (or DeBakey Type III) aortic dissection was clearly identified using the Aplio i-series 900 CV system. The diagnosis was later confirmed on reconstructed CT angiography.

Aortic dissection is an acute life threatening condition of the aorta, and is associated with significant mortality and morbidity [1]. In particular, acute aortic dissection is the most common aortic catastrophe, with prognosis and management determined by the location of the affected aortic segment. Aortic dissection involving the ascending aorta (Stanford type A or DeBakey type I/II) is treated with urgent surgical intervention, whereas acute aortic dissection involving the descending thoracic aorta (Stanford Type B or DeBakey type III) is managed medically or by surgical or endovascular intervention when complicated [2]. Type B aortic dissections are known to constitute 25 to 40% of all aortic dissections [3].

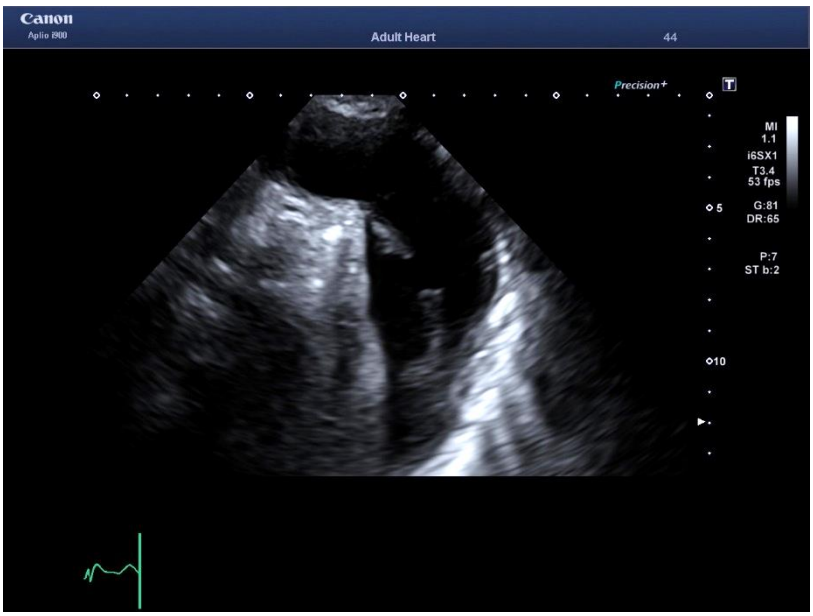



Fig 1: Suprasternal view showing intimal flaps in a descending aortic dissection

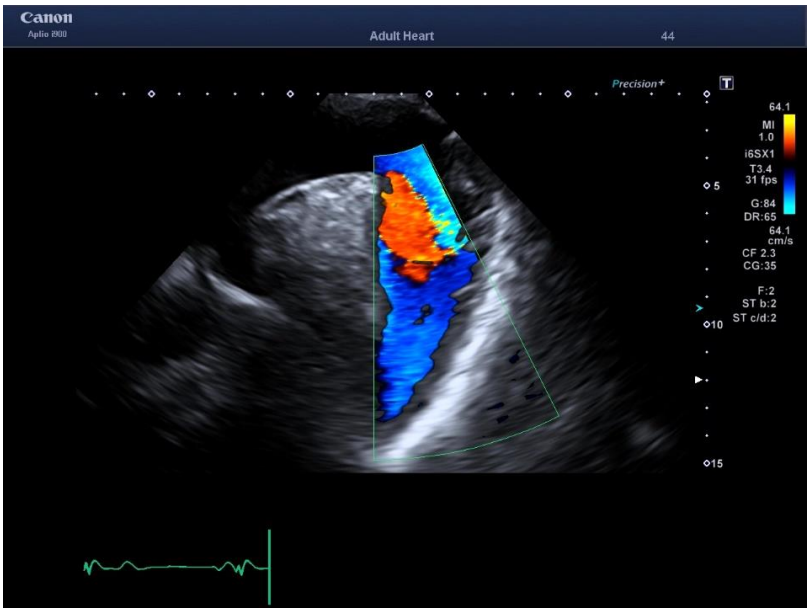



Fig 2: Colour Doppler demonstrating retrograde flow in the false lumen of a descending aortic dissection

## Discussion

Canon Medical's Aplio i-series 900 CV uses state-of-the-art iBeam forming to clearly identify even the most unusual or complex of lesions. The system architecture is built on 3 technologies working together to optimize beam efficiency simultaneously [4].




>> Transmitting multiple pulses

For increased penetration, and signal to noise ratio improving spatial and contrast resolution thereby reducing artifacts

>> Receiving multiple signals

For improved lateral and temporal resolution and higher frame rates

>> Processing multiple signals

For a thinner more homogenous beam and improved clarity

Fig 3: iBeam architecture provides unsurpassed image quality while maintaining high frame rates, standard on all Aplio i-series systems.

From this, the Aplio i-series 900 CV offers an enhanced imaging tool – Precision Imaging. The signal processing technique is a unique Canon Medical noise cancellation technology.

Precision Imaging involves ultrasound line density pattern recognition in the time dimension, where noise is removed by examining each scan line returning to the transducer. If an Echo is present in one scan line as well as an adjacent scan line, algorithms are calculated to determine if the Echo is real or noise. A real Echo is enhanced and kept, whereas an Echo considered to be noise or clutter is removed from the image.

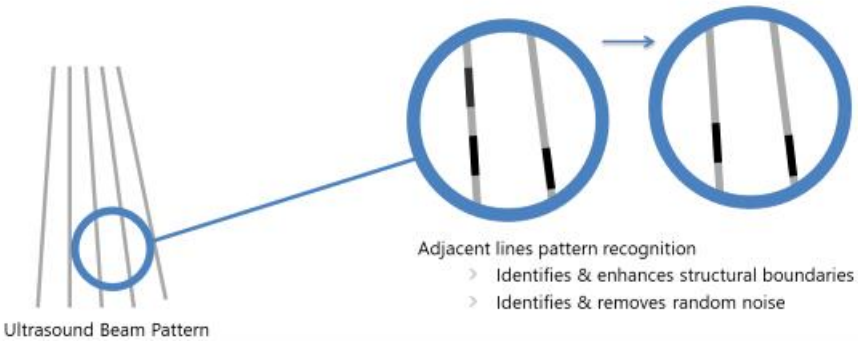



Fig 4: Precision Imaging enhances border detection and removes noise through ultrasound line density pattern recognition.

Precision Imaging levels are progressive with higher levels applying increased levels of noise cancellation resulting in greater border detection and enhancement, and noise removal. There is no data or frame rate loss only improved contrast resolution, with sharper edges and layers and widespread areas appearing more homogenous.

## Conclusion

Canon Medical's Aplio i-series 900 CV offers enhanced iBeam forming with Precision Imaging to clearly identify and assess even the most unusual lesions easily, improving patient management.

## References

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