ARDMS

SPI

Sonography Principles and Instrumentation

Latest Version: 6.0

Question: 1

What causes color flash artifact?

A. Aliasing
B. Tissue motion
C. High velocity blood flow
D. Strong reflector

Answer: B

Explanation:
Color flash artifact occurs due to tissue motion. This artifact is a type of color Doppler artifact that happens when there is movement of tissue or transducer, which causes the Doppler system to incorrectly interpret the motion as blood flow. This results in a flash of color appearing on the image where there is actually no flow. Tissue motion affects the Doppler signal, leading to misinterpretation by the system, and hence the artifact appears as a flash of color.
Reference:
ARDMS Sonography Principles and Instrumentation (SPI) Exam Study Guide
"Diagnostic Ultrasound: Principles and Instruments" by Frederick W. Kremkau

Question: 2

Which statement describes the purpose of using a spectral Doppler wall filter?

A. To widen the area in which the Doppler shift is sampled
B. To clean up the audio signals
C. To eliminate the higher velocity signals
D. To eliminate the lower velocity signals

Answer: D

Explanation:
The purpose of using a spectral Doppler wall filter is to eliminate lower velocity signals. Wall filters are designed to remove low-frequency Doppler shifts caused by the motion of the vessel walls or surrounding tissues, which are generally of no diagnostic value. By eliminating these lower velocity signals, the wall filter helps to clean up the Doppler signal and reduce clutter, allowing for a clearer and more accurate display of blood flow velocities.
Reference:
ARDMS Sonography Principles and Instrumentation (SPI) Exam Study Guide
"Diagnostic Ultrasound: Principles and Instruments" by Frederick W. Kremkau

Question: 3

Which artifact may be caused by incorrect color Dopplergain setting?

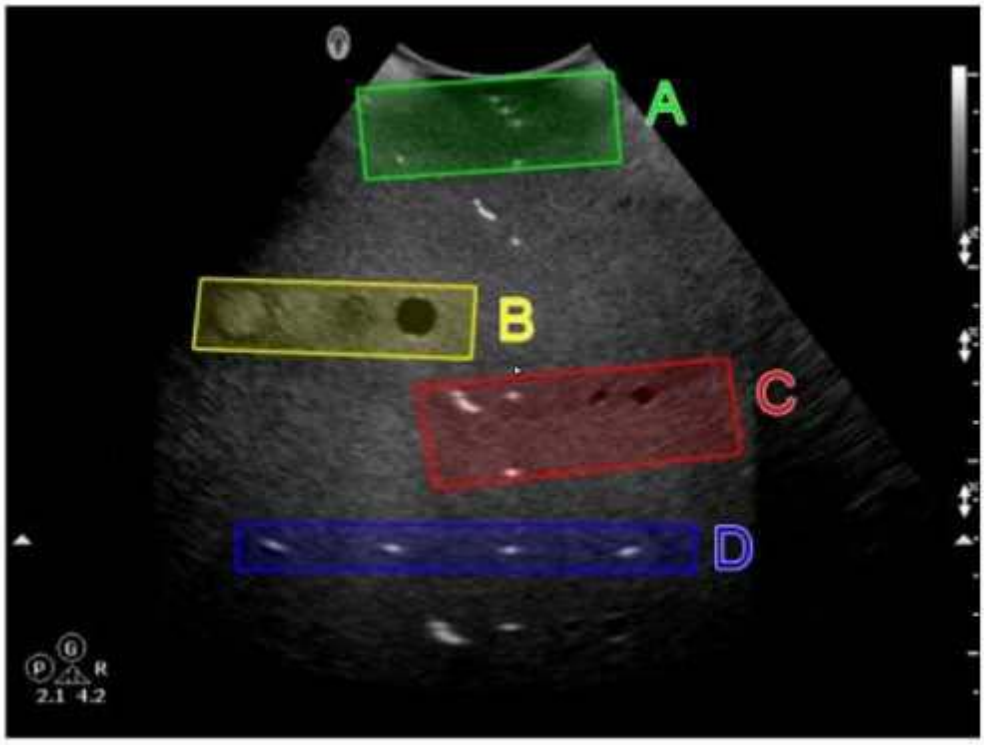
A. Bleed/Blossoming
B. Clutter/Haze
C. Twinkle
D. Aliasing

Answer: A

Explanation:
Incorrect color Doppler gain settings can cause the artifact known as bleed or blossoming. When the color Doppler gain is set too high, it can cause the color signal to "bleed" outside the actual boundaries of the blood vessel, leading to an overestimation of the area of flow. This artifact makes it appear as though the blood flow extends beyond the true vessel walls, which can obscure the accurate interpretation of the Doppler image.
Reference:
ARDMS Sonography Principles and Instrumentation (SPI) Exam Study Guide
"Diagnostic Ultrasound: Principles and Instruments" by Frederick W. Kremkau

Question: 4

Which target group is used to evaluate transverse distance measurement accuracy in this tissuemimicking phantom image?



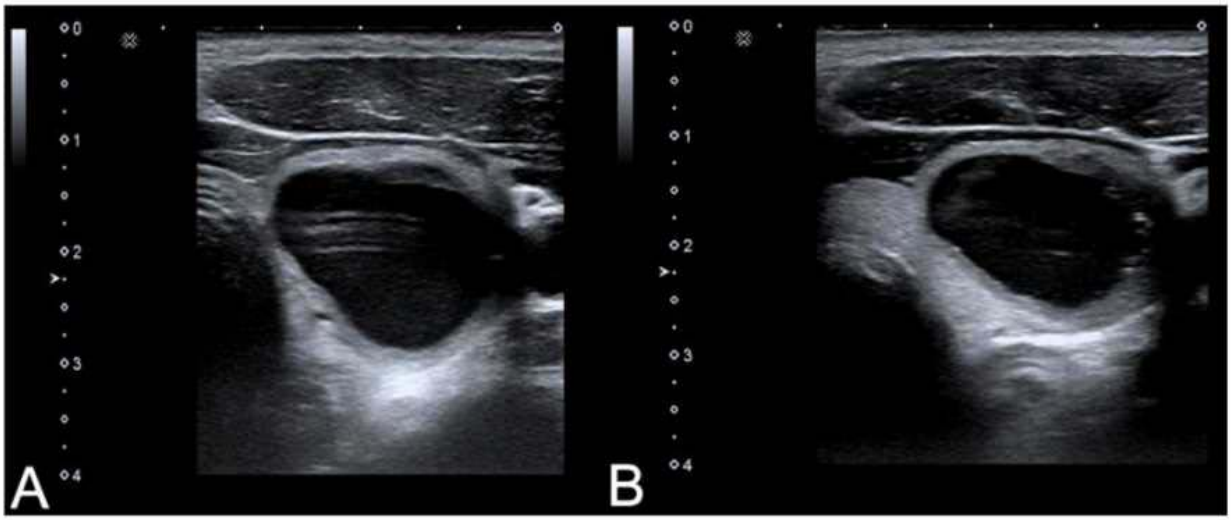
A. Option A
B. Option B
C. Option C
D. Option D

Answer: D

Explanation:
In the tissue-mimicking phantom image, Option D (blue box) is used to evaluate transverse distance measurement accuracy. Phantoms are used to simulate human tissue and provide a standardized way to test the accuracy and precision of ultrasound machines. Transverse distance measurement accuracy is assessed by measuring known distances between targets in the phantom. The blue box (Option D) typically contains targets positioned to specifically test the accuracy of transverse measurements, ensuring that the ultrasound system provides reliable and precise distance readings.
Reference:
ARDMS Sonography Principles and Instrumentation (SPI) Exam Study Guide
"Quality Assurance for Ultrasound Imaging Systems" by AAPM (American Association of Physicists in Medicine)

Question: 5

Which adjustment will reduce the artifact in the cystic lesion in image A resulting in image B?



A. Turn off harmonics
B. Increase dynamic range
C. Turn on edge enhancement

Answer: C

Explanation:
Edge enhancement is a processing technique used in ultrasound imaging to improve the visibility of the edges of structures.
In image A, the borders of the cystic lesion might appear less defined due to a lack of edge enhancement.
By turning on edge enhancement, the ultrasound system processes the image to accentuate the boundaries, leading to a clearer and more distinct outline of the cystic lesion as seen in image B.
This adjustment reduces the artifact within the cystic lesion by emphasizing the differences in the adjacent tissue interfaces, thus improving the overall image quality. Reference:
American Registry for Diagnostic Medical Sonography (ARDMS) Sonography Principles and Instrumentation guidelines on image optimization techniques.

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