Myocardial Contrast Echocardiography
with New Contrast Agent
SONAZOID®

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Sonazoid reconstituted product and perflubutane microbubbles

Typical image from optical microscope on Sonazoid reconstituted product

Pattern diagram of perflubutane microbubble

Perflubutane gas: PFB (C₄F₁₀)

Hydrogenated egg phosphatidyl serine (sodium): HEPS

10μm

Sonazoid reconstituted in saline for injection of 2.5mL

- Volume concentration: 6.9μL MB/mL
- Particle size: 2.3~2.9μm (median diameter)
- Involving gas: Perflubutane (C₄F₁₀)
- Membrane element: Hydrogenated egg phosphatidyl serine (sodium)
- pH: 5.7~7.0
- Osmotic pressure ratio: 0.9~1.1

Reconstituted Sonazoid

T-shape stopcock

Saline
Approximately 10mL
(For route flush)

Device setting was MI 0.40 and 0.22

2.5ml of Sonazoid was injected slowly, taking over 10 seconds.

Device setting was MI 0.40 and 0.22
We performed MCE by using a new contrast agent Sonazoid®, and measured intensity difference to confirm whether significant coronary artery stenosis (75% ≤) was detectable by MCE alone.
Patients

※ Total 24 patients who had undergone CAG were enrolled in this study. The informed consents were obtained from all of the patients enrolled.

※ 75% \leq \text{coronary artery stenosis} 

Gr A: 3 AP views of 55 segments (seg.)
Gr B: SAXpm view of 51 seg.
Normal coronary arteries
Gr C: 3 AP views of 113 seg.
Gr D: SAXpm view of 69 seg.

※ The intensities of all 4 gr. of pre- and postinjection of Sonazoid were compared (unpaired t test).
A case of single vessel disease of #7 75% stenosis

LCA

RCA

Normal RCA
MI : 0.40

APLAX view
MI: 0.40

Sonazoid MCE
Sonazoid Intencity

APLAX view
MI : 0.40

AP 2ch view
MI : 0.4

Sonazoid MCE
Sonazoid MCE
Sonazoid Intencity Curve

AP 2ch view
AP 4ch view

MI : 0.40
MI : 0.4

Sonazoid MCE
Sonazoid MCE
Sonazoid Intencity Curve

AP 4ch view
SAXpm view

MI : 0.22
MI : 0.22

Sonazoid MCE
MI : 0.22

Sonazoid MCE
Sonazoid Intencity Curve

SAXpm view
Patients

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Intensity Difference between Pre- and Post Injection

75% ≤ stenosis coronary artery group:
- Gr A (AP view) : 1.3±3.5 db (N.S.)
- Gr B (SAX view) : 0.9±3.3 db (N.S.)

Normal coronary artery group:
- Gr C (AP view) : 14.1±5.8 db (p<0.001)
- Gr D (SAX view) : 11.5±4.3 db (p<0.001)
Sonazoid MCE

75% ≤ coronary artery stenosis could be detected by intensity difference ≤ 6.3 dB in AP view with

- sensitivity : 0.98
- specificity : 0.94
- diagnostic accuracy : 0.97

and ≤ 5.1 db in SAXpm view with

- sensitivity : 0.97
- specificity : 0.94
- diagnostic accuracy : 0.97
Conclusion

Sonazoid® MCE has good clinical utility and has better accuracy than other MCE to detect a significant coronary artery stenosis.

Since the sensitivity, specificity and accuracy are highly reliable as shown above, it is appreciated that $75\% \leq$ coronary artery stenosis could be detected by Sonazoid® MCE alone.