Vascular

Using DynamicStentView Effectively

## Tokorozawa Heart Center

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Tokorozawa Heart Center has used Shimadzu's FPD-equipped angiography systems since it's founding. As of October 2012, the Tokorozawa Heart Center has two catheterization rooms, performs over 800 PCI procedures per year, and provides 24-hour medical examination and treatment services to the local community.
Tokorozawa Heart Center recently introduced DynamicStentView (hereafter StentView), a new PCI support software, and we talked with the director of Tokorozawa Heart Center about how StentView is being used in clinical practice, what they think are the relative advantages of the software (interview conducted in the catheterization room of Tokorozawa Heart Center, October 16, 2012).

– **You have rated the StentView software very highly, but what in kinds of cases is it used normally?**

While we keep no track of use in a quantitative way, recently we have been using StentView during almost all cases. It is most commonly used when positioning a balloon for stent re-expansion **(Fig. 1)**. One advantage of the StentView software is its ability to display images in real time. When positioning a balloon in very small, one-millimeter increments, cardiac motion always shifts the balloon out of position since it takes time to display images. Images displayed in real time are extremely useful in these situations, as well as in any work involving fine positioning on the millimeter-scale such as positioning a stent so it just overlaps another stent, or when using a stent near the limit of its length **(Fig. 2 (a), 2 (b))**. StentView also performs image enhancements that clearly show the degree of stent expansion, which allows additional expansion to be used immediately in the event of inadequate expansion **(Fig. 3)**. The real-time display of images is extremely important. Recently, stents have also been becoming thinner and longer. For example, the left coronary artery has a different diameter at its distal and proximal ends, so matching the stent diameter to one end of the artery requires additional pressure adjustments and re-expansions. When performing this kind of procedure, StentView allows positioning the balloon so that it stays inside the stent and identifying
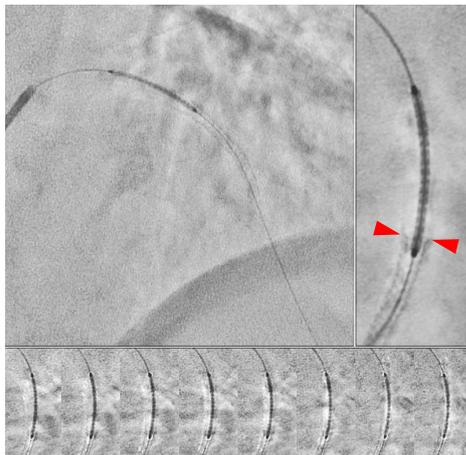
locations where expansion is poor, thereby replacing the need to use IVUS. This saves on work and reduces procedure times.
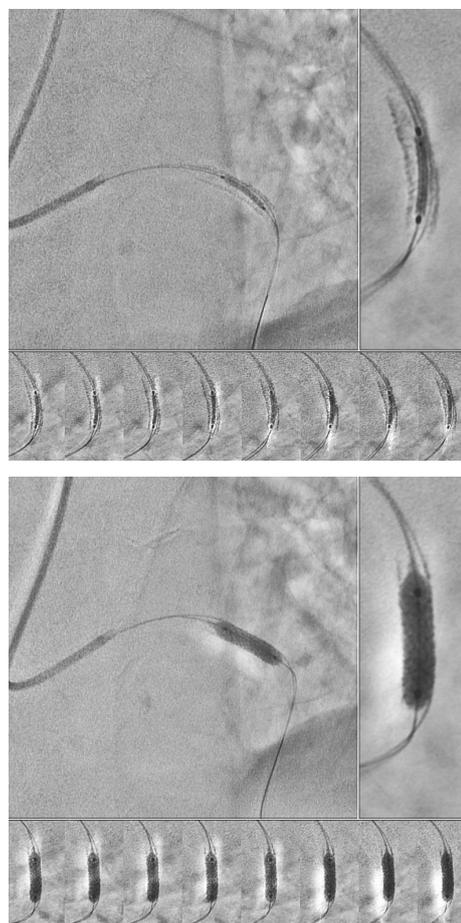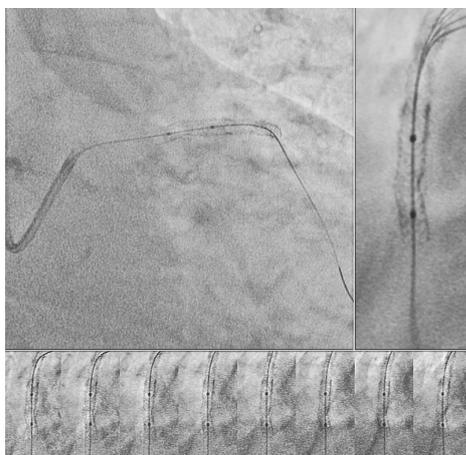

Fig. 1 Using StentView for stent re-expansion
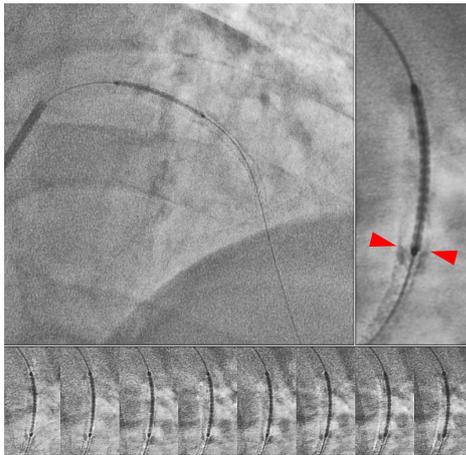
Fig. 2 (a)   Using StentView to check the stent edge at the distal end when overlapping the stents at the proximal end

Fig. 2 (b)   Insufficient overlapping confirmed in **Fig. 2 (a)**. Using StentView to check positioning while inserting the balloon a little further


Fig. 3   Inadequate expansion. Using StentView to position a stent for additional expansion

– What has changed in terms of PCI procedures before and after introducing StentView?

Before we used StentView, I had seen a similar type of software and noticed how it enhanced the stent image, but at the time I thought we could perform fine without it. When I actually started using the StentView and was able to check my progress in real time and position stents more accurately, it really improved my confidence during procedures. It bears repeating that StentView is very useful during fine positioning, and I am even more confident while working with high pressures. The fact StentView has improved confidence during the procedure is a valuable benefit. Time is also very important. Using StentView means you do not have to use IVUS to repeatedly confirm your progress by removing the balloon. This reduces time spent implementing the procedure and is another important benefit of using StentView. Our younger physicians are currently also using StentView during procedures, and feel less confident when they are not using it. I think the time will soon come when this kind of software is an indispensable part of performing these procedures.

– You are viewing images in a way that is conceptually different to how you used to. What in your mind is the most characteristic quality of this change?

You realize it immediately when you see the dynamic images, but the most characteristic difference is the ability to view the stent in what appears to be a static position, with the marker held in the center of the view area **(Fig. 4)**. Also, it is very useful to view the area of interest in real time by simply depressing a foot switch. The addition processing used by the software to enhance the image so that unevenness is finely visible even on thin stents. I think the StentView software really is something new and unique.
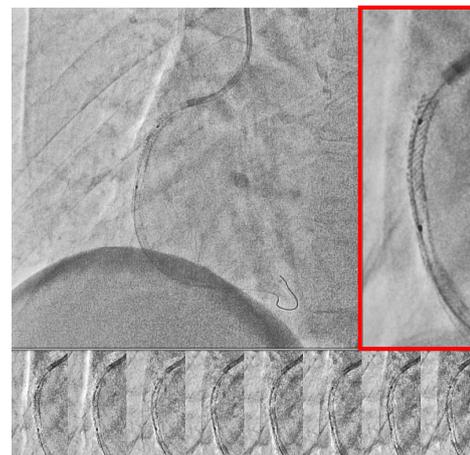
Fig. 4   Red border indicates the image around a marker that appears static

– In what other cases do you find StentView useful?

With lesions at a flexural area, a catheter gets stuck on an previously placed stent when adding a second stent. The stent can flare or become dislodged **(Fig. 5)**. Some stents are also longitudinally weak. In such cases, using StentView makes procedures safer in that you can observe for deformation of the stent while the procedure is ongoing and adjust your actions moment-by-moment, such as deciding when to stop pushing so hard. You can also quickly acknowledge when to change strategy and pull out.

Fig. 5 Using StentView to check a stent that has flared and started to become dislodged

– What do you expect to see in angiography systems in the future?

Although our hospital does not use a bi-plane angiography system yet, the existing Shimadzu system allows rotational radiography. It is extremely useful as it allows you to view lesion progress from any angle, something not possible with bi-plane radiography. One concern I have is how much rotational radiography increases exposure relative to the normal bi-plane radiography. Procedures like CTO take a long time to perform, and frame rates can be lowered to reduce exposure or raised to increase visibility as required. But, since it is important to avoid exposing the same areas of the body to X-rays, I think if software was developed that could monitor which surface areas of the body had received what doses of radiation, we could reduce the burden on the patient somewhat by shifting the exposure position slightly, or by changing the angle of the C-arm during long procedures. That is one feature I expect to see in the future.

– Thank you.