

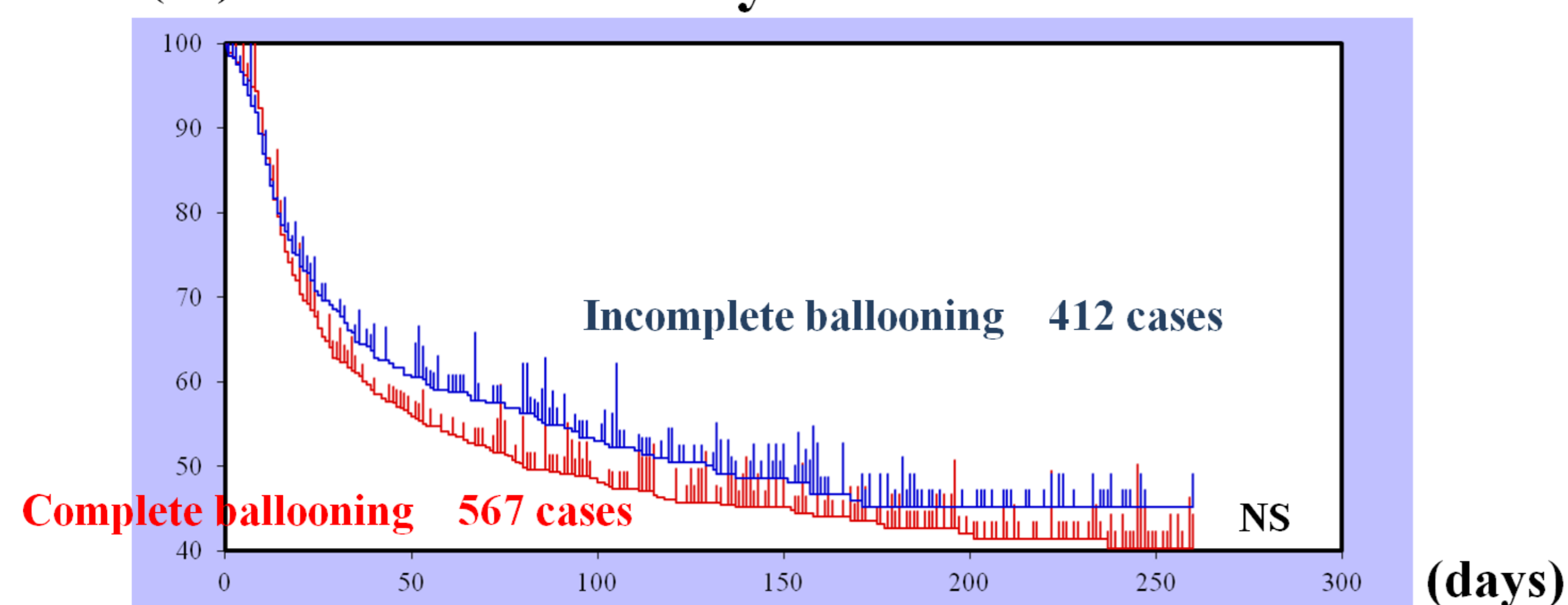
Repeated Low Pressure Technique

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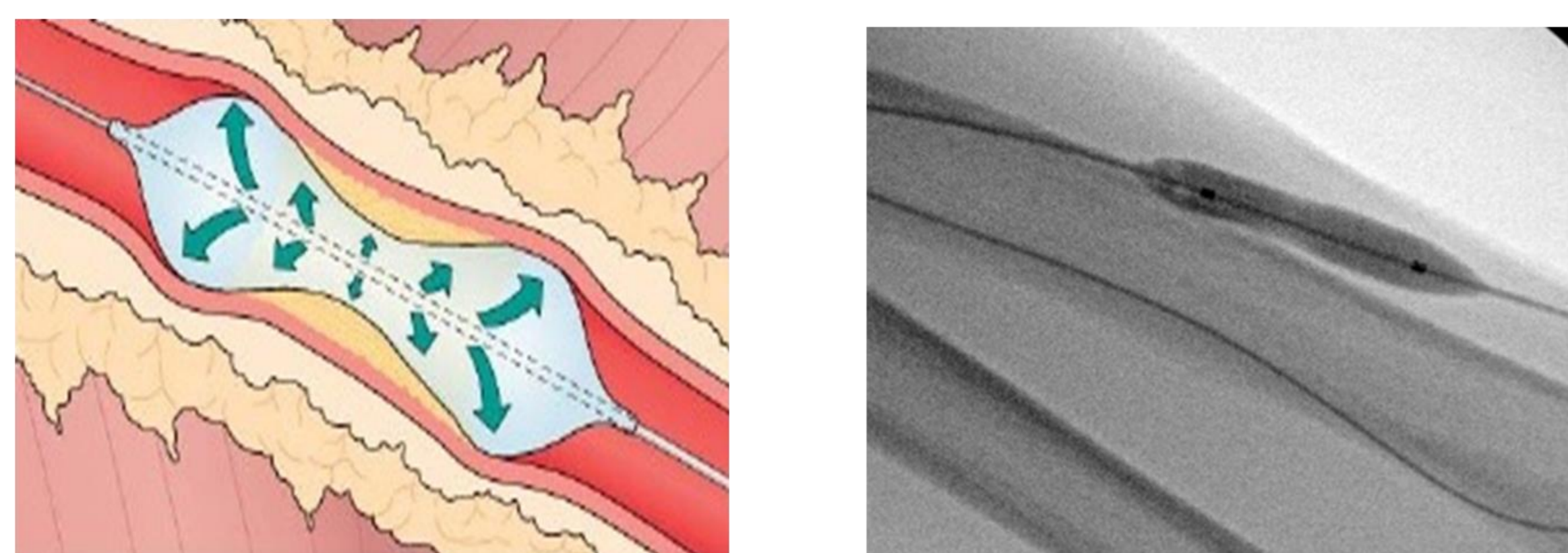
Backgrounds

This figure shows a patency curve pattern that we treated for vascular access stenosis from 2003 to 2010. Blue lines show the cases where we opened balloons incompletely. Red lines show the cases where we opened balloons completely, and is below the blue line. Why isn't the patency rate of the completely ballooned cases as good as the incompletely ballooned cases? There was a possibility that some extra complications might occur when the balloon is opened completely. For examples, spasm, bleeding, acute obstruction and acceleration of restenosis according to the damage to intima. Vascular access is made through veins. We purposely create high blood flow volume through the vein to maintain hemodialysis. But, the higher the flow volume of the blood, the more the body tries to suppress the flow. Since we noticed this trend, our aim is to open the balloon with less injury to intima, and to keep a moderate flow volume for dialysis.

(%) AVF Patency rate 2003 ~ 2010

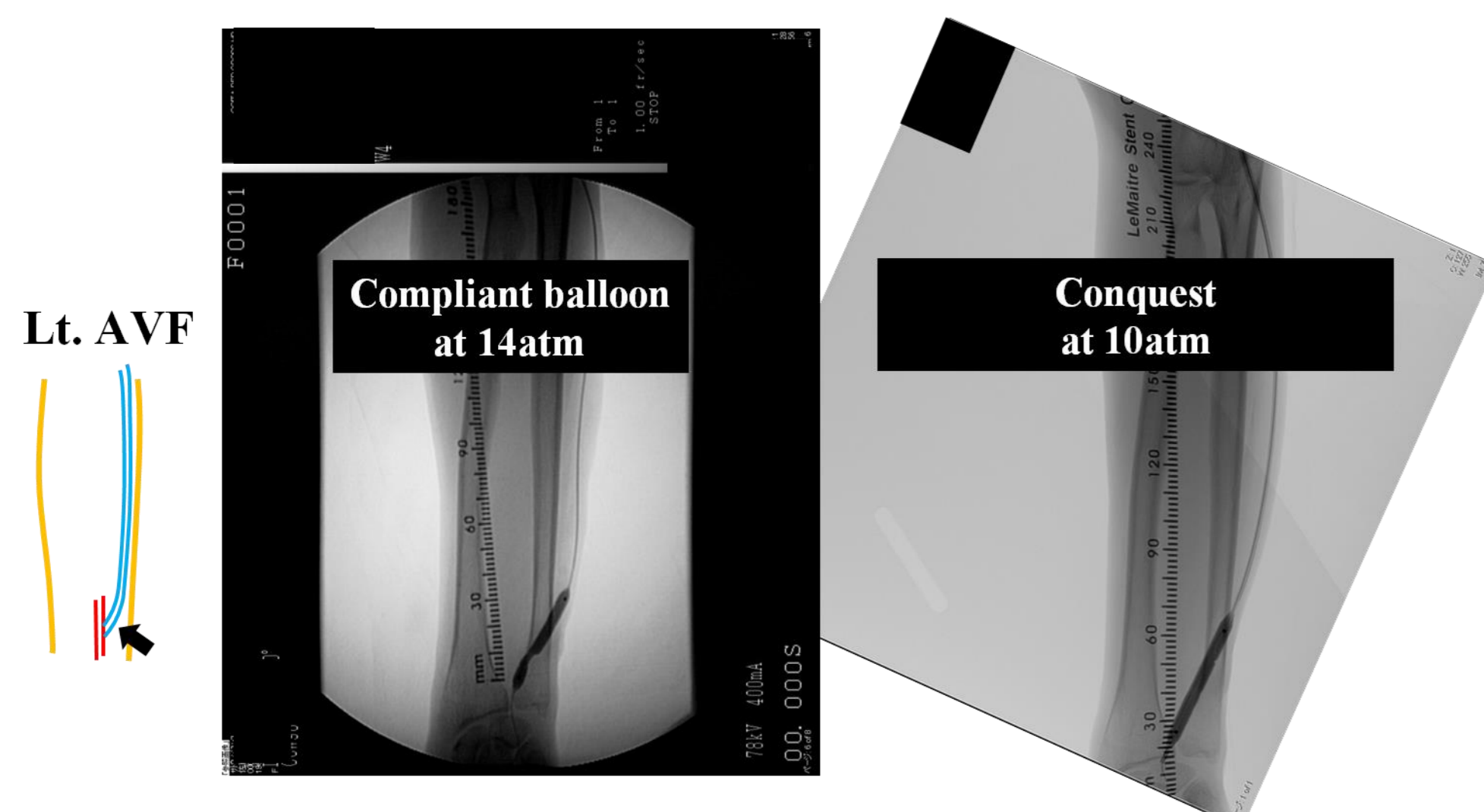


We have to understand the dog-bone phenomenon. As you can see, Semi-compliant balloon can't expand effectively at the stenosis points because of their dog-bone phenomenon. Compliant balloons cause damage around the point of stenosis when they are used under high pressure. We want to expand only stenosis points in order to minimize the damage as much as we can. So, we usually use super non-compliant balloons Conquest, because they never expand more than their size.



Semi compliant balloon

We sometimes experience what is shown in the next figure. These are the same patient angiographs, and the same stenosis point above the AV fistula. We couldn't expand incompletely by using compliant balloon at 14atm, but expand completely by using Conquest at 10atm. Conquest is effective even under low pressure. We use this characteristic of Conquest.



We must also point out that we have certain restrictions of our health insurance system in Japan. Almost all Japanese medical treatment is covered by health insurance. Of course PTA is covered under our system, however, this procedure is permitted only 1time in 3 months. Also only 1 balloon can be used. On top of that, stent usage is not covered by insurance in our area of Fukuoka. If we want to use a stent, we have to cover the cost ourselves. Complications from ruptured blood vessels are something we want to avoid.

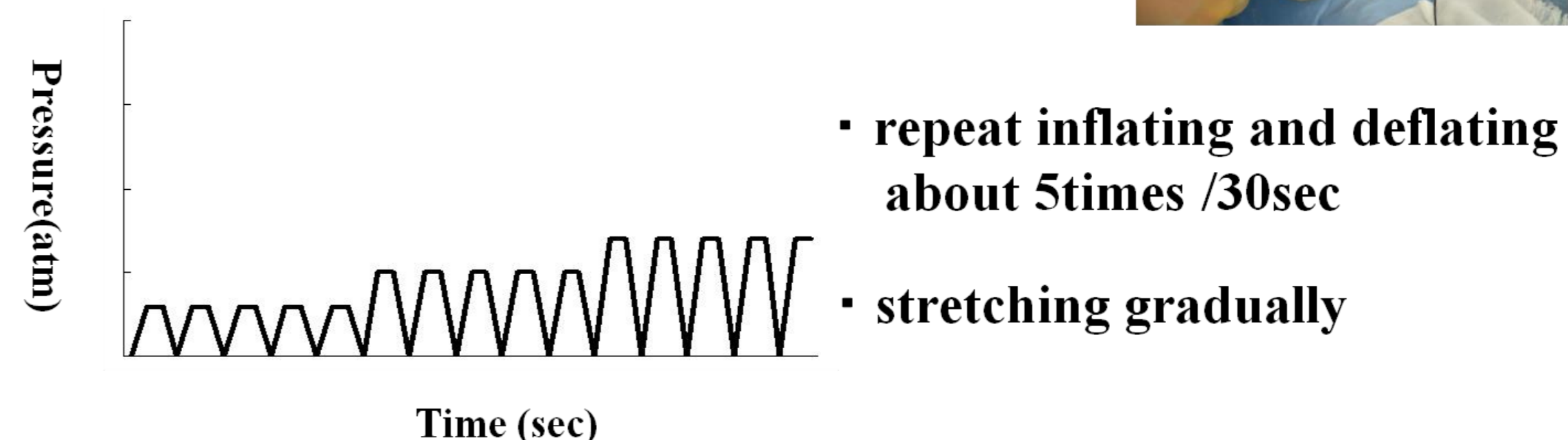
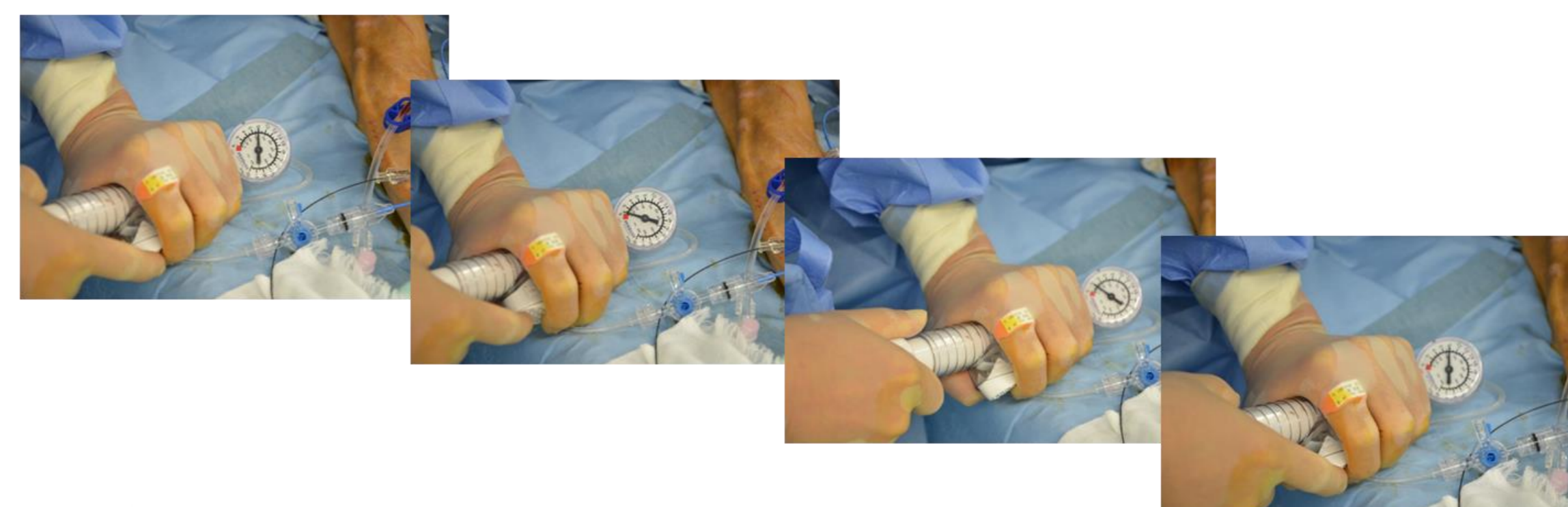
Purpose

To improve the patency rate and avoid rupture, we changed our way of expanding to minimize damage to the intima. In order to achieve this, we use our repeated low pressure technique with super non-compliant balloons Conquest.

Method

This is our way of expanding. We increase pressure gradually. We begin by inflating and deflating to a maximum pressure of 2-3 atm, 5 times in about 30 seconds. Then we repeat this procedure, increasing the maximum pressure each cycle. Of course, the amount of pressure it is increased by, is decided on a case by case basis.

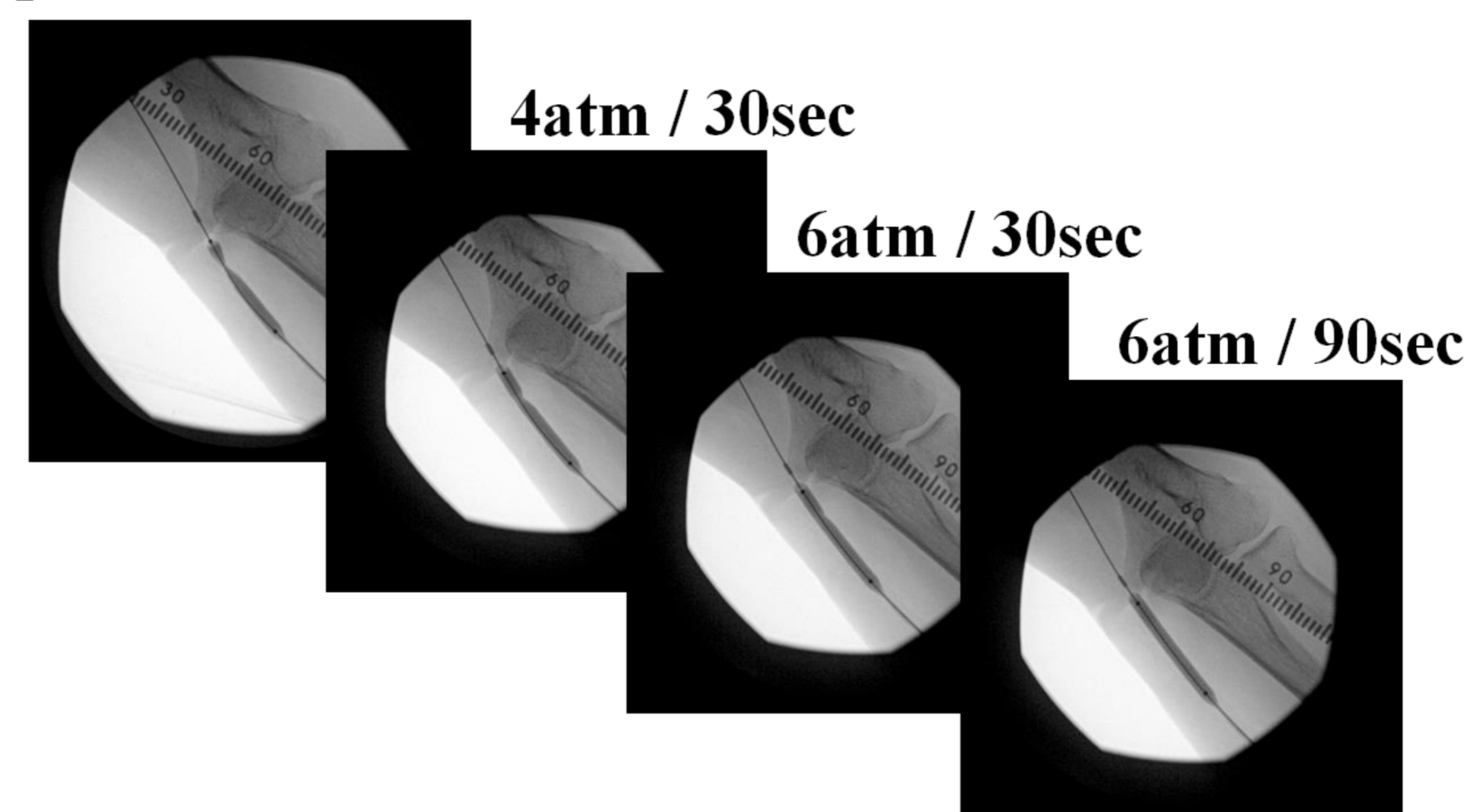
Repeated low pressure technique



Results

For example, we alternate between pressures of 2 atm and 0 atm for 30seconds. Increase the pressure to 4atm and continue the procedure. Increase the pressure to 6atm. There is still a small stenosis. We use the same pressure repeatedly, instead of increasing pressure. As a crude example, when you put on newly washed jeans and they are tight, you can get them to fit comfortably by gradually bending and flexing. This is similar. We repeat the procedure for 90 seconds. We could expand completely using 6 atm. It is very safe expanding.

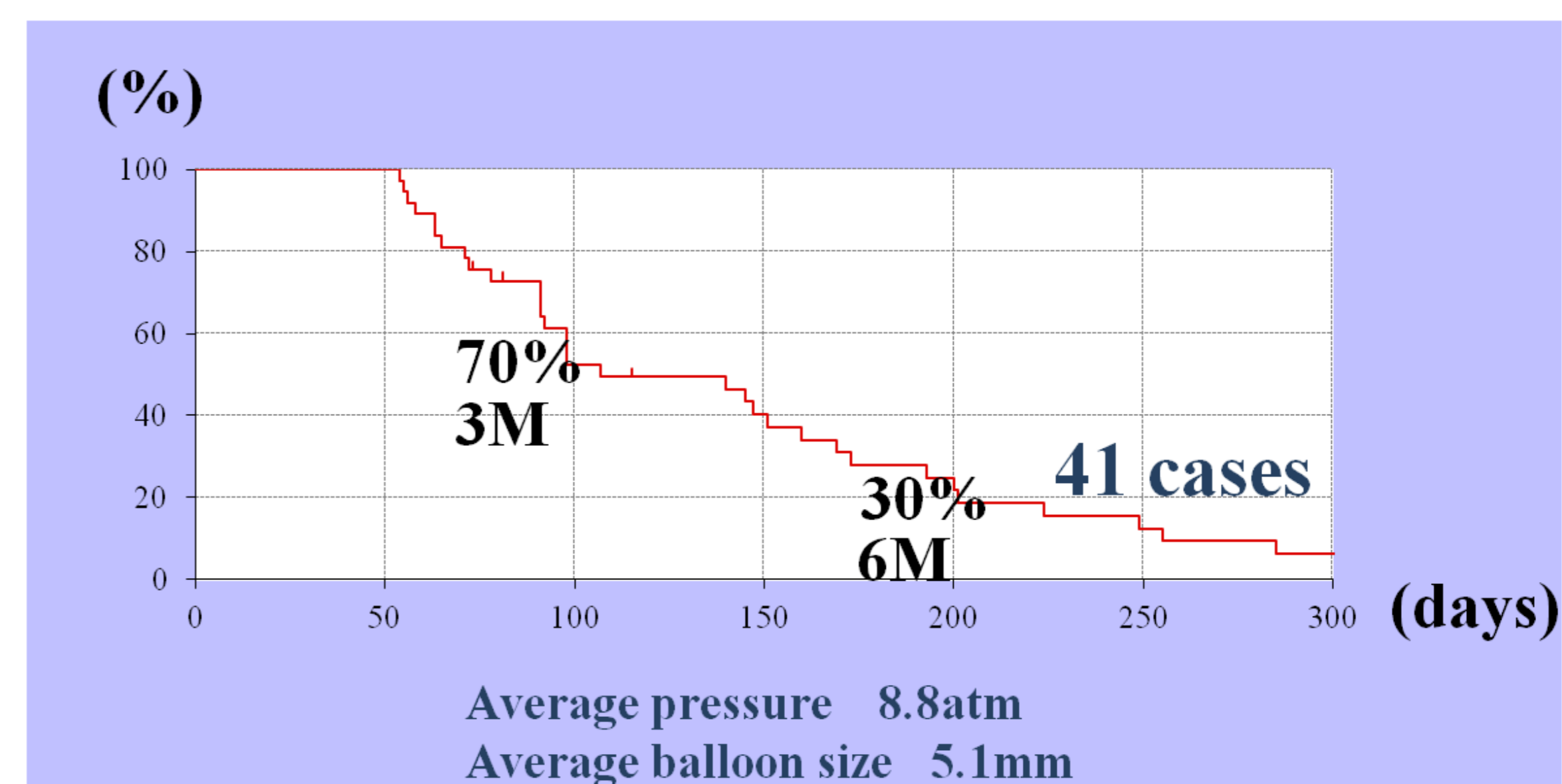
Conquest at 2atm / 30sec



The patency rate was 70% at 3months and 30% at 6months. Average pressure was 8.8atm. Average balloon size was 5.1mm. Out of 41 cases, we didn't experience bleeding complications. This technique is not aggressive and speedy, but effective, safe and has less complications for a variety of cases.

AVF Patency rate

- using Repeated low pressure technique by Conquest -



Conclusions

Repeated low pressure technique is effective method for expanding without rupture. Dog-bone phenomenon can be avoided by using super non-compliant balloon Conquest.

COI disclosure

This presentation is not related to any companies with a conflict of interest that should be disclosed.