RAJ SHAH: This is a 72-year-old male, status post cholecystectomy that presented at an outside facility with jaundice and right upper quadrant abdominal pain. He underwent an ERCP with biliary sphincterotomy, followed by a partial, but incomplete, stone extraction. He was referred to the University of Colorado hospital for a repeat attempt and potential intraductal lithotripsy for clearance of the bile duct stone. At time of ERCP at the University of Colorado hospital by balloon occlusion cholangiogram revealed a dilated bile duct and a large oval stone measuring approximately 20 millimeters by 14 millimeters in diameter and a distal bile duct narrowing that tapered smoothly toward the biliary orifice.

Initially, we chose to use a short-wire system and use the short-wire CRE balloon that has a three-centimeter length, as opposed to the 5.5 centimeter length of the traditional CRE balloon dilator. Now, this easily passes over a short guide wire. And the advantages of the shorter balloon is that it's easier to keep a parallel axis with the bile duct during balloon dilation to avoid upstream trauma. And the other piece is if the bile duct stone is more distal, then the shorter balloon allows for nudging the stone, if you will, upstream part of the duct during dilation to avoid impaction of the stone against the distal bile duct mucosa.

Following this dilation and mild oozing that subsequently stopped, we're able to use a basket and additional lithotripsy had been performed preceding this balloon dilation. And subsequently, this basket was utilized to remove stone fragments and then the largest aspect of the stone, which was a pigmented stone, or mixed cholesterol and pigment, which is typical of a primary duct stone. Following this extraction, we utilized mostly an open basket once reintroduced into the bile duct, along with a sterile saline irrigation to clear stone fragments to continue to assure clearance of the bile duct. I often will use the irrigation through the irrigation port of the basket to clean out stone fragments from the basket prior to reintroduction into the bile duct. And then we follow this with an appropriate-sized extraction balloon to remove additional stone fragments along with the use of sterile saline irrigation to clear the bile duct.

It's important to assure clearance of the smaller fragments to reduce the risk of stone recurrence. And on final occlusion cholangiogram, you seek clearance of the large bile duct stone. And the patient was left without a stent and has done well on follow up.

Currently, there are several techniques that can be utilized to extract difficult common bile duct stones. And they include sphincterotomy and balloon extraction, or mechanical lithotripsy, endoscopic papillary large balloon dilation, and cholangioscopy with intraductal lithotripsy with either EHO or laser lithotripsy.

We often look at the anatomy of the duct to determine whether there is any distal buildup narrowing. And with the introduction of a short-wire CRE balloon, with a shorter length, I think there are some advantages that allow us to use the existing ERCP wire and not require a long guide wire, which many of us are utilizing short wire systems for ERCP procedures, and has simplified the approach to difficult common bile duct stones, often requiring complementary or adjunctive therapies, either with balloon dilation alone or in addition to extension of sphincterotomy or intraductal lithotripsy techniques.