Broken Screw Removal Protocol

CAT-1132-01 (C718)

Broken screws are not very common; however, they do occur occasionally. In some cases it is for good reason and the screw breaks in order to protect the implant from failure. There may be one or more contributing factors that lead up to a screw fracturing, and it is often difficult to determine the cause. However the cause should be determined and rectified where possible.

In order to remove a broken screw, a step-wise approach is used. The screw removal instrumentation may only be used with a high torque – low speed motor unit, in reverse. 600 – 800 rpm for the I-SR-6 with copious irrigation, and 10 - 20 rpm for the I-SR-3.
Only a high torque – low speed motor unit may be used, since it must be noted that the implant could be overheated via friction and this may lead to failure of the implant. The principle of the screw removers is that they embed into the screw, grip, and rotate the screw out in a reverse direction. It is imperative that the instructions for use be followed precisely.

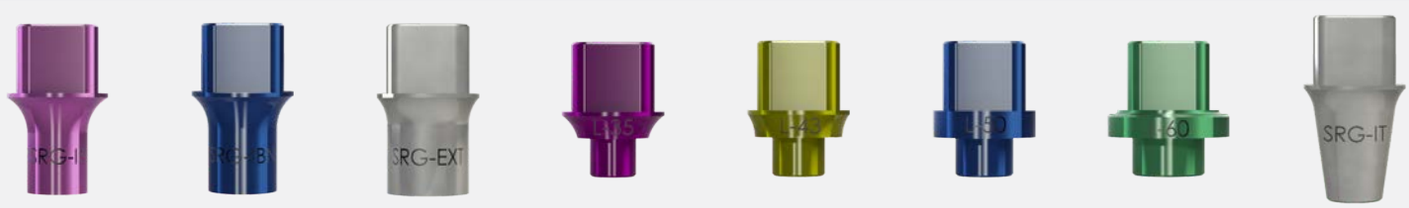
Prior to the use of screw removal instrumentation, less aggressive techniques should be applied.

Step 1
The use of a fine probe to gently rotate the broken screw in an anti-clockwise direction, may often turn the screw out, to the point that it may be gripped with a haemostat and rotated out fully. The screw is usually quite loose once it has fractured, and should be freely able to rotate.

Step 2
Should step 1 not be successful and the screw is not loose, the use of an ultrasonic scaler in the same manner as the probe, should be applied. Often, the ultrasound assists in the rotation/freeing up of the screw. Once the screw has been exposed to ultrasound, Step 1 should be applied a second time, if the ultrasound is not successful on its own.

Step 3
The screw removal instrumentation is the most aggressive technique and if used incorrectly, can be most damaging and possibly result in complete removal of the implant. Using this instrumentation, a correct path of insertion is very important, hence the use of drill guides to assist in the procedure.
Firstly, the correct drill guide must be selected for the corresponding implant. Once the correct drill guide has been selected, it is placed on top of the implant interface, in preparation to guide the screw removal drills. It must be ensured that the drill guide is correctly seated on the implant interface. Each drill guide has a square connection on the opposing end, allowing them to be stabilized using a ratchet or torque wrench.

Screw Removal Guides are available for the following connections:



3mm Diameter Piccolo Implant | 3.25mm Diameter IBN/T Implant | Other Ex Hex Implants | 3.5mm Diameter Tri-Nex Implant | 4.3mm Diameter Tri-Nex Implant | 5.0mm Diameter Tri-Nex Implant | 6.0mm Diameter Tri-Nex Implant | IT Implant Range

The screw removal drills rotate in a counter-clockwise direction. The first drill, (I-SR-6), cuts a pilot hole in the center of the screw to be removed.

It is quite possible that this drilling process may thread the screw out the implant, if the drill grips sufficiently while cutting a pilot hole.
It must be noted that if the carbon steel tip of the I-SR-6 breaks off inside the implant, it is possible that the implant will need to be removed.
If the I-SR-6 does not remove the screw, the next drill, I-SR-3 will be used.

Once the pilot hole has been cut by the I-SR-6, the I-SR-3 is designed to wedge into and engage the internal walls of the pilot hole, and rotate the fractured screw out in a counter-clockwise direction.

Should this not be successful, a small rosehead bur may also be tried to rotate the screw out by hand.

If the screw is successfully removed, it is important to ensure that the internal thread of the implant has not been damaged. This can be done using a healing abutment or impression coping pin.

Should there be significant resistance when checking the internal thread for damage, it may be necessary to clean the internal thread of the implant by carefully using a thread tap.