

SURGICAL PROCEDURE
SET FOR SCREWS EXTRACTION



Instrument set for screw extraction

Indications

The instrument set is designed for extraction of damaged bone screws that may not be removed using standard procedures. At the same time, the instrument set can also be used for the removal of broken drills and screw taps.

Operating technique

1. Extraction of undamaged screw

– Describes screw extraction using a standard method. The screw must not be damaged in any way.

Incision

– The surgeon will define size of the incision. It should be large enough so that the screw to be extracted is clearly visible.

Cleaning of internal hexagon

– Screw hexagon must be properly free of in-grown tissue (Fig. 1). Proper cleaning is necessary for correct insertion of a screwdriver.

Removal of the screw

– The most important step for correct removal of a screw is good placement of the screwdriver into the screw head. Poor contact of the screwdriver with the screw head is likely to damage both the screwdriver and the inner hexagon of the screw head (Fig.2).

– Select appropriate screwdriver size for extraction of the screw. Connect the screwdriver with the axial holder or T-holder (Fig. 3). In no circumstances connect the screwdriver with an electric drill.

– When releasing the screw, ensure the screwdriver is perpendicular to the screw head and the screwdriver is fully placed in the screw head before extinction (Fig. 4).

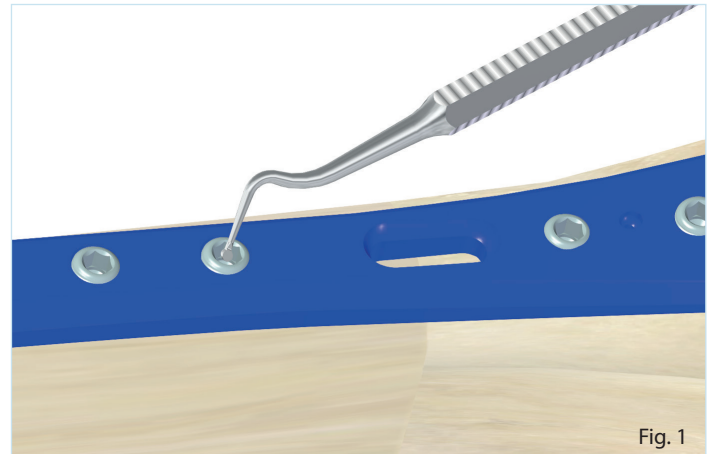


Fig. 1

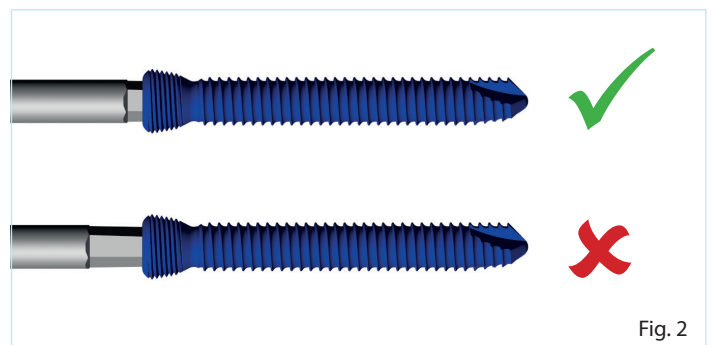


Fig. 2

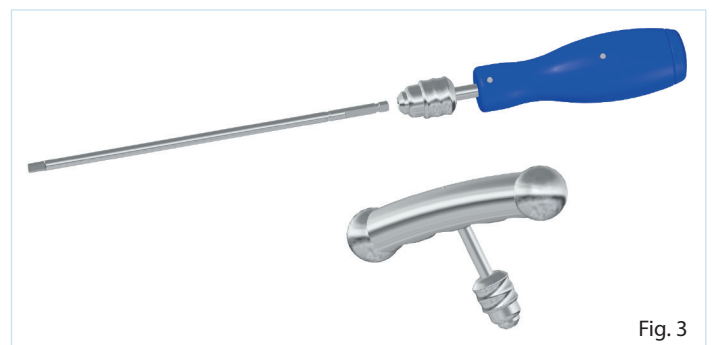


Fig. 3

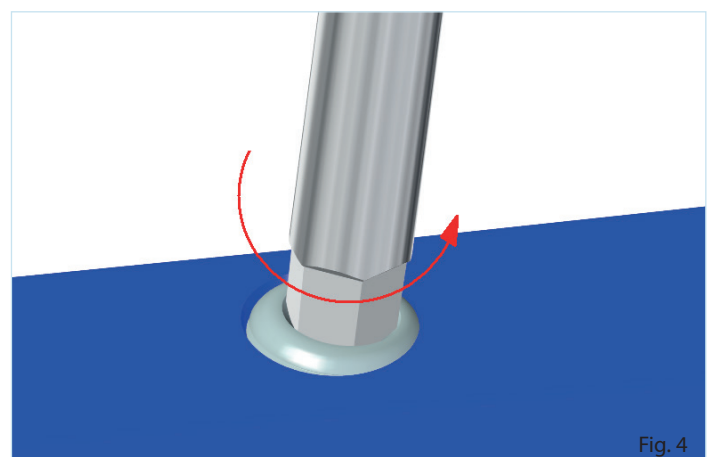


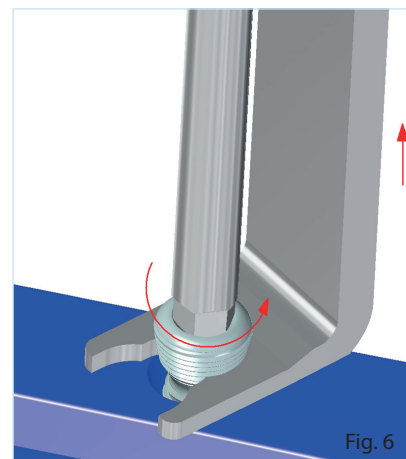
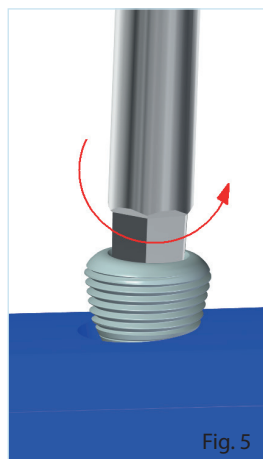
Fig. 4

2. Extraction of the screw with a damaged thread on shank

The incision and cleaning procedures are identical to the previous case.

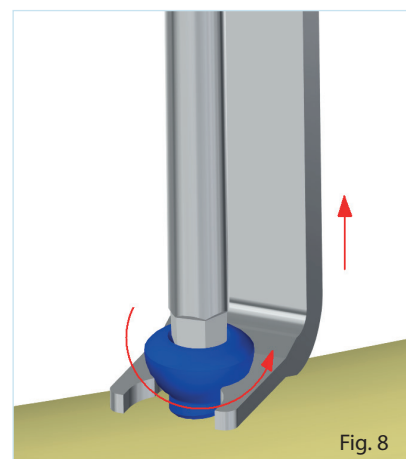
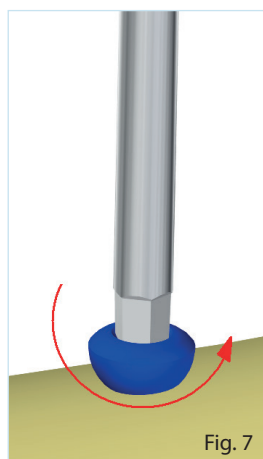
a) Removal of a screw locked in a splint

- Release the screw as much as possible. Minimal distance is the length of the thread head (Fig. 5).
- Slide the extractor under screw head and carefully pull upwards while unscrewing the screw. It helps to release the screw (Fig. 6).



b) Removal of a screw from a bone

- Try to release the screw in a standard way (Fig. 7).
- Slide the extractor under screw head, and carefully pull upwards while unscrewing the screw (Fig. 8).

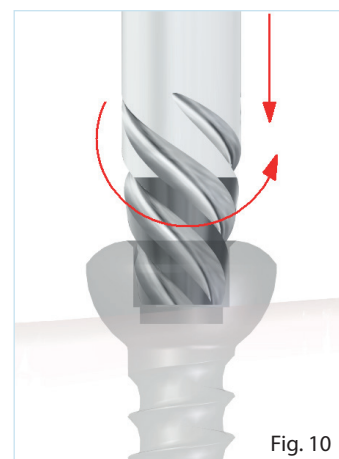
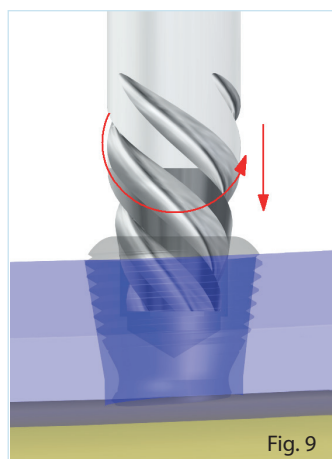


3. Extraction of a screw with damaged hexagon

The incision and cleaning procedures are identical to previous case.

a) Use of the extractor

- Rotate the extractor counterclockwise and slightly push into the screw (Fig. 9 and 10). The extractor will stick in the damaged hexagon and release the screw from a splint, or a bone.



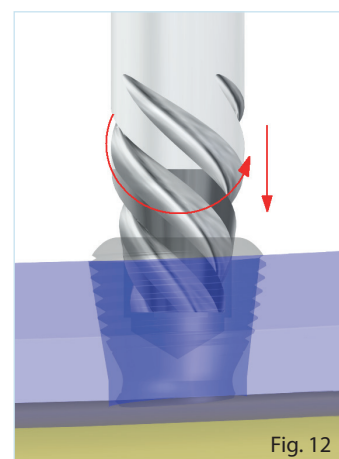
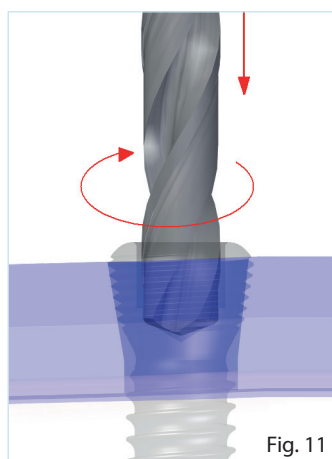
b) Use of the drill and extractor

- If it is not possible to remove the screw with the extractor only, the hexagon can be re-drilled with Titex drill (Fig. 11). Then use the extractor which will stick in the re-drilled hole for extraction (Fig. 12).

⚠ – Perfect incision draping is required when using the drill. Cool the drills with a solution during use.

⚠ – Use the drill with an electric drill. Direction of rotation is clockwise.

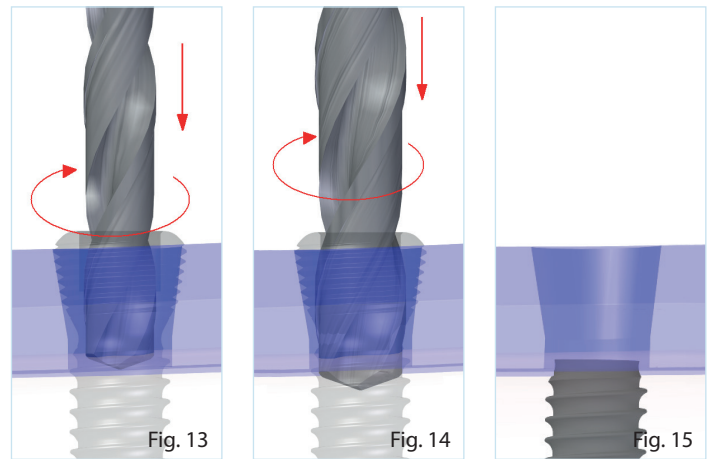
⚠ – Check the drills after each use.



c) Drilling off the screw head

– Drill off the screw head in successive steps. Size of the drills for drilling off is selected so that only a small part of the screw head is removed each time (Fig. 13, 14, 15).

- ⚠ – Perfect incision draping is required when using the drill. Cool the drills with a solution during use.
- ⚠ – Use the drill with an electric drill. Direction of rotation is clockwise.
- ⚠ – Check the drills after each use.

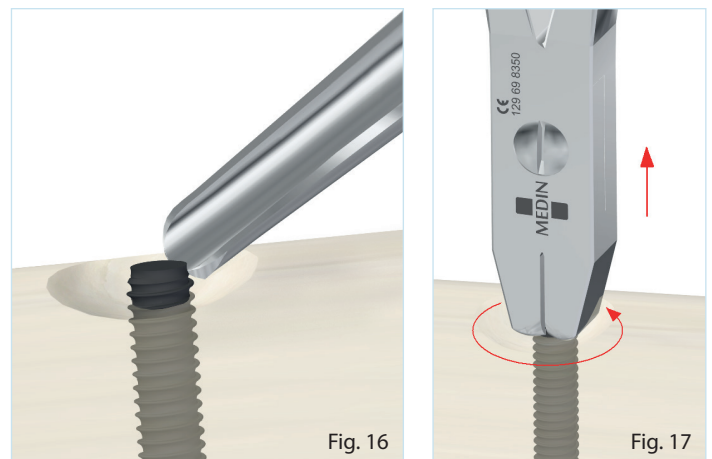


4. Extraction of a screw without screw head

The incision and cleaning procedures are identical to previous case.

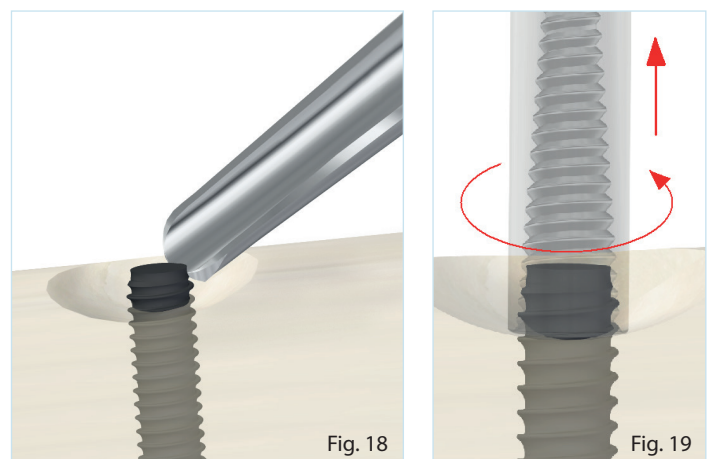
a) Removal of a screw with forceps

- Use a gouge to make sufficient space around the screw in the bone for clamping the screw shank with the forceps (Fig. 16).
- The extractor with internal left-hand thread must be screwed on the screw shank and rotated counterclockwise in order to remove the screw from the bone (Fig. 19).



b) Removal of screw using the extractor

- Use a gouge to make sufficient space around the screw in the bone for clamping of the screw shank in the extractor (Fig. 18).
- The extractor with internal left-hand thread must be screwed on the screw shank and rotate counterclockwise to screw out from the bone (Fig. 19).



5. Extraction of a broken screw

The incision and cleaning procedures are identical to previous case.

When removing the first part of the screw, the extraction procedure is identical to the procedure in chapter for extraction of a screw without head (Fig. 20 and 21).

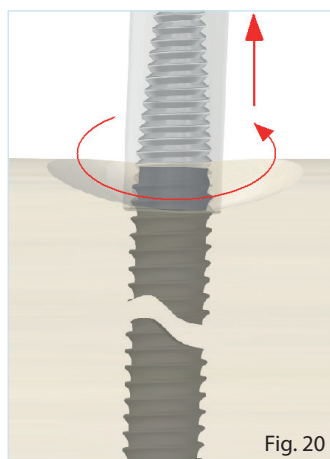


Fig. 20



Fig. 21

Removal of a broken part of the screw from bone

- Use a cylindrical cutter to cut a guide hole for the cutter. Cut down until the cutter reaches the screw.
- Use the cutter to create a hole around the broken screw deep enough to screw on the extractor (Fig. 23).

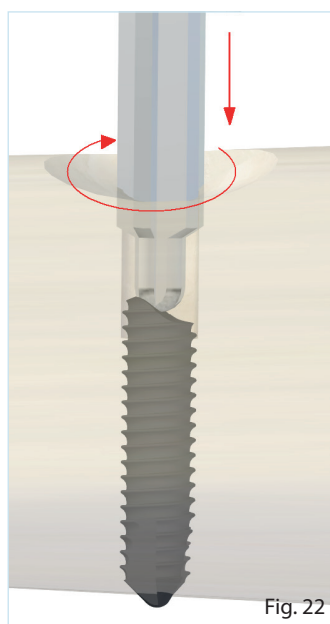


Fig. 22

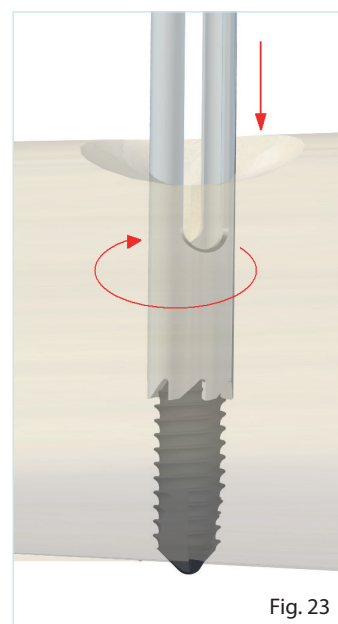


Fig. 23

- The extractor with internal left-hand thread must be screwed on the screw shank and rotated counterclockwise in order to remove the screw from the bone (Fig. 24).

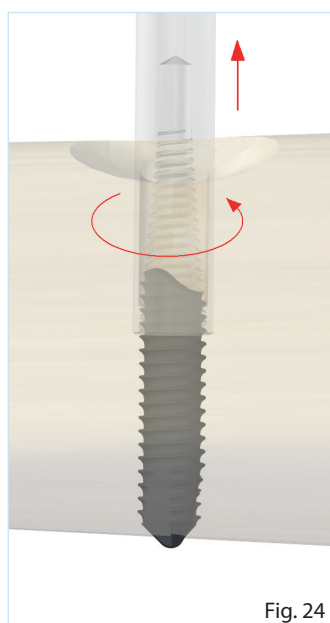
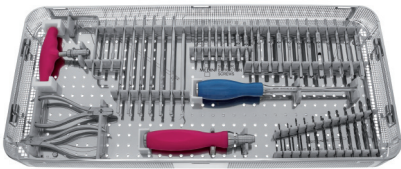


Fig. 24

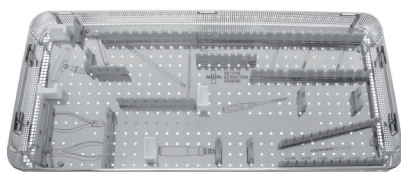


397 139 09 0650 Set for screw extraction
540 × 240 × 50 mm
including instruments



397 129 69 7795 set

Item No.	Part No.	Description	Quantity (pcs)
1	397 129 69 8260	Drill 2.1×49 mm	2
2	397 129 69 8270	Drill 2.5×57 mm	2
3	397 129 69 7740	Drill 2.8×61 mm	2
4	397 129 69 7750	Drill 3.6×70 mm	2
5	397 129 69 8290	Drill 4.1×75 mm	2
6	397 129 69 7770	Drill 5.1×86 mm	2
7	397 129 69 8220	Cylindrical cutter 2/2.4/2.7	1
8	397 129 79 4600	Cylindrical cutter 3.5/4	1
9	397 129 79 4610	Cylindrical cutter 4.5/5	1
10	397 129 79 4620	Cylindrical cutter 6.5/7	1
11	397 129 69 8230	Cutter 2/2.4/2.7	1
12	397 129 79 4570	Cutter 3.5/4	1
13	397 129 79 4580	Cutter 4.5/5	1
14	397 129 79 4590	Cutter 6.5/7	1
15	397 129 69 8210	Extractor 2/2.4/2.7	1
16	397 129 79 4540	Extractor 3.5/4	1
17	397 129 79 4550	Extractor 4.5/5	1
18	397 129 79 4560	Extractor 6.5/7	1
19	397 129 69 8181	Extractor 2	2
20	397 129 69 7711	Extractor 2.5	2
21	397 129 69 7721	Extractor 3.5	2
22	397 129 69 7731	Extractor 5	2
23	397 129 69 7910	Bit, hexagon 2 mm	2
24	397 129 69 5231	Screwdriver, hexagon 2.5 mm	2
25	397 129 69 5251	Screwdriver, hexagon 3.5 mm	2
26	397 129 69 5273	Screwdriver, hexagon 5 mm	2
27	397 128 09 0140	Orthopedic gouge 6 mm; 23.5 cm	1
28	397 148 51 0100	Excavator double-sided	1
29	397 129 69 7800	Screw extractor	1
30	397 129 69 8350	Forceps for removing screws	1
31	397 129 69 8360	Forceps for removing screws 2/2.4/2.7 mm	1
32	BD23-110-AO	Handle AO; 30×151 mm	1
33	BT19-095-AO	T-handle AO; 95×81 mm	1



397 129 69 7790 Sieve for instruments for screw extraction
540 × 240 × 50 mm
excluding instruments

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