

User Experience Network

Arthroscopic Burs and Blades Are Breaking in Patients

HOSPITAL

During an otherwise uncomplicated arthroscopic knee procedure, a disposable spherical bur shaver started to disintegrate, leaving metal filings in the joint. Thorough flushing of the joint was needed to remove these filings, delaying the procedure by 5 to 10 minutes. A postoperative x-ray showed that all significantly sized filings were removed.

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We examined the failed bur and found that the cutting surface was scarred with a series of chipped notches, which wound helically around the bur's spherical head. Also, there was a groove on the inside of the bur's sheath that was shaved into the metal by the bur.

We believe that this damage was caused by the bur being pushed against the sheath (see Figure). Two factors allowed this to happen: First, the shaft of the bur in question is a 14 cm stainless steel tube, which can flex if enough transverse force (force perpendicular to the tube's axis) is applied to the tip. And second, the bur/tube assembly is not rigidly held in place when installed in the shaver handpiece; the connection between these two components has intentionally been given some play to allow for interfacing with quick-connecting disposable tools.

Because of this design, which is common for both bur- and blade-type shavers, these instruments can't handle large transverse forces. While they do cut material in the transverse direction, they need to be moved into the material slowly enough to cut away everything in their path before being advanced. The cutting tool, not the application

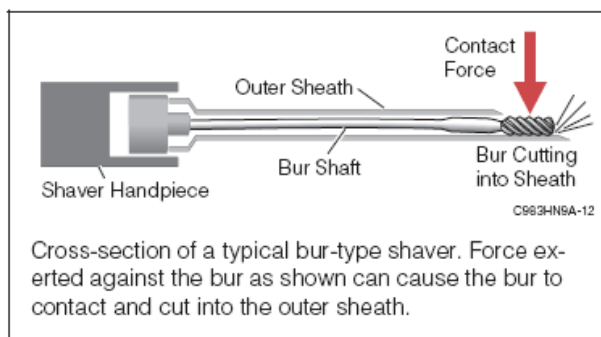
force, should do the work. Suppliers should be responsible for instructing surgeons about how much force is necessary for cutting and the fact that bearing down too hard can damage the equipment.

Bur/blade shaver failure is a common problem: the U.S. Food and Drug Administration (FDA) regularly receives reports of bur and blade breakage involving most major shaver brands. Although we are unaware of any published study that analyzes the cause of these failures, one of the blade suppliers informs us that, in its experience, the cause is almost always the surgeon pushing too hard on the instrument. We believe this is an accurate assessment. Another common cause for bur/blade failure is contact with other metal instruments being used in the procedure.

The blade failures discussed in this report are mainly inconveniences. They cause delays in surgery while the broken chips are cleaned from the joint, and they increase costs when equipment has to be replaced.

RECOMMENDATIONS

1. Alert surgeons to the problem described in this report.
2. If a bur breaks, first look for scoring on the inside of the sheath. This will indicate that the damage was caused by excessive pressure on the shaver. Recommend that surgeons contact shaver suppliers for instruction on how much transverse pressure can be applied to arthroscopic shavers.
3. If only the bur itself shows damage and not the sheath, check any other metal instruments used in the procedure to see if they were cut into. If they were, ensure that surgeons understand the potential damage and inconvenience that results from allowing the bur or blade to come into contact with other surgical instruments during use.



UMDNS information. Arthroscopic Shaver Systems [17-918] ■ Burs, Orthopedic [17-995] ■ Cutters, Meniscus [17-117]

Supplier information. These devices are available from a variety of suppliers; consult ECRI's *Health Devices Sourcebook* for a list of companies. ♦