

Bone Graft Collection Using Stryker Bone Vac and Arthrex GraftNet™ XL Devices

Arthrex Research and Development

OBJECTIVE

This study was conducted to evaluate the Bone Vac (Stryker) in conjunction with the GraftNet XL device (Arthrex) for collecting bone particulate during high-speed burring of porcine spine specimens. The primary objective was to determine the amount of bone particulate lost by the Stryker Bone Vac after collection was completed.¹

METHODS AND MATERIALS

Bone particulate was collected from the lamina and facet of vertebrae in three porcine spines ($n = 3$) using a 3 mm round burr tip at maximum speed while maintaining specimen hydration. The sample was first suctioned into the Bone Vac, and any remaining particulate lost into the effluent tubing was then captured in the GraftNet XL device (Figure 1). Bone particulate was collected until the

Bone Vac device was full. The weights of the specimen cup for the Bone Vac sample and the GraftNet XL device basket were recorded before and after collection to calculate sample mass and loss. Filtration paper was used to measure effluent waste from the GraftNet XL device.

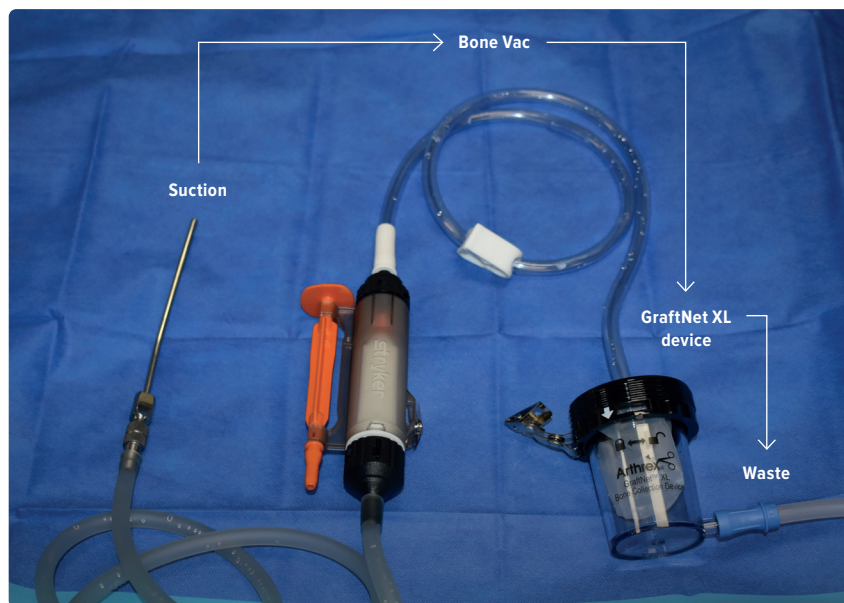


Figure 1A: Test setup for bone particulate to flow through the Bone Vac, then GraftNet XL device, and finally to the waste container.

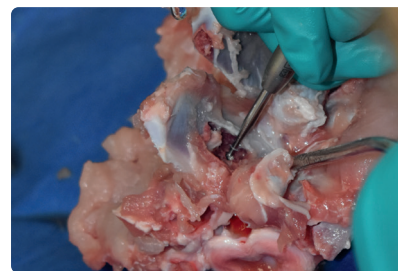


Figure 1B

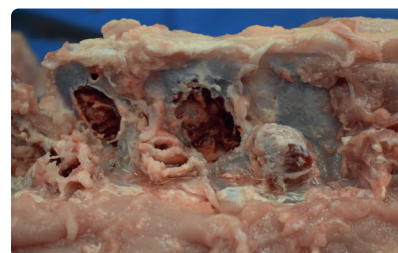


Figure 1C



RESULTS

Table 1. Percent loss of bone particulate from the Bone Vac device captured by the GraftNet™ XL device after full collection, and waste loss from the GraftNet XL device, with donor average and standard deviation (AVG ± SD).

Specimen	Bone loss of Bone Vac (%)	Bone loss of GraftNet XL device (%)
Donor 1	44.5	3.3
Donor 2	30.8	0.0
Donor 3	32.9	7.9
AVG ± SD	36.1 ± 7.4	3.7 ± 4.0

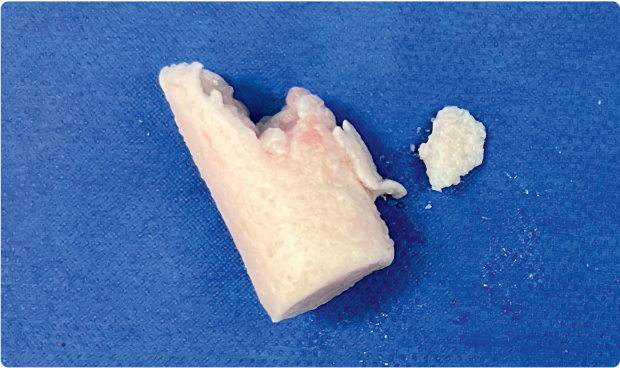


Figure 2A. Bone Vac sample (average mass = 10.1 g ± 2.1 g).



Figure 2B. Graft loss from Stryker Bone Vac. GraftNet XL device sample (average mass = 5.7 g ± 1.3 g).

The percent loss of bone particulate from the Bone Vac into the GraftNet XL device was 36.1% ± 7.4% after full collection. Waste loss into the effluent container averaged 3.7% ± 4.0% (Table 1). The Bone Vac device collected an average total mass of 10.1 g ± 2.1 g, while the GraftNet XL device captured an average of 5.7 g ± 1.3 g lost from the Bone Vac device (Figure 2).

DISCUSSION AND CONCLUSION

In all donors, a significant amount of bone particulate was not captured in the Bone Vac device. Additionally, the Bone Vac device reached capacity before its marketed maximum, indicating potential limitations.

These findings suggest that while both the Bone Vac (Stryker) and GraftNet XL (Arthrex) devices capture bone particulate, approximately one-third of the total sample

is lost from the Bone Vac device and captured by the GraftNet XL device. This has implications for clinical use, particularly in procedures where maximizing graft yield is crucial, reducing the need for additional graft extenders, and for retaining smaller particulates within the sample which could lead to improved osteogenic outcomes.^{2,3}

References

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3. Zhou X, Zhang Z, Li S, Bai Y, Xu H. Osteoconduction of different sizes of anorganic bone particles in a model of guided bone regeneration. *Br J Oral Maxillofac Surg.* 2011;49(1):37-41. doi:10.1016/j.bjoms.2010.01.001