

How we do it: the absorbable gelatin sponge cube, an effective and economical approach to packing in ear surgery

S FANG, K ARGIRIS, N PADGHAM

Department of Otolaryngology, William Harvey Hospital, Ashford, UK

Abstract

Introduction: There is currently a lack of robust evidence on the best form of packing for otological surgery. We describe the use of the absorbable gelatin sponge, a packing material that does not require removal and has the benefit of being considerably cheaper compared to other common forms of ear packing.

Methods: A comparison was made of the financial cost of several forms of packing for common otological procedures. In addition, a retrospective audit of complications was undertaken of all patients in whom the absorbable gelatin sponge was used over the past three years.

Results: The absorbable gelatin sponge was shown to be cheaper to purchase per unit and also more economical to use. It has been the exclusive form of packing used in 519 procedures over the past three years at the William Harvey Hospital in Ashford (UK), with very few complications noted at the follow-up review.

Conclusion: We strongly advocate using the absorbable gelatin sponge, a packing material that is kinder to the patient, has similar efficacy to other forms of packing and is also much cheaper to use compared to other common forms of packing.

Key words: Surgery; Otolaryngology; Ear, External; Ear, Middle; Otologic Surgical Procedures; Biological Dressings; Gelatin

Introduction

Otological surgery of the external auditory meatus, tympanic membrane or middle ear commonly requires some form of ear packing. The principal purpose is to maintain mild pressure on the operating site, allow delivery of local antibiotics and aid normal wound healing. The overall use of ear packing has, however, been questioned in the past; nonetheless, the vast majority of otological clinics use some form of packing.¹ There is a lack of robust evidence comparing the efficacies of the different packs available, with the current English-language literature showing no significant difference between commonly used dressings, such as bismuth iodoform paraffin paste (BIPP), Pope otowicks, Silastic[®] sheeting and tri-adcortyl ointment.^{2,3} The choice of packing used is usually dictated by availability and the personal preference of the surgeon.

The most widely used form of ear packing is sterile ribbon gauze impregnated with BIPP. It may also be in the form of nylon tape or cotton balls, with or without Silastic sheeting. Less traditional methods of dressing include Pope otowicks, sponge balls (microspheres) and gelatin-based dressings, such as the absorbable haemostatic gelatin sponge (Spongostan). Most of these packing materials require a follow-up appointment post-operatively for removal, which often causes distress and pain to patients, especially children, who may subsequently require further general anaesthesia for pack removal. In addition, these materials are expensive to

purchase and are frequently uneconomical to use due to the form in which they are manufactured. As a result, large quantities of expensive packing are wasted every time it is used, therefore incurring considerable financial costs.

We describe here the use of a packing material, the absorbable gelatin sponge, manufactured by Spiggle & Theis

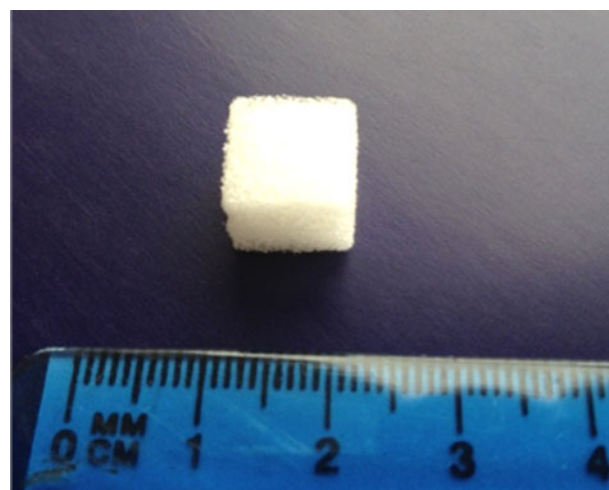


FIG. 1
Absorbable gelatin sponge cube.

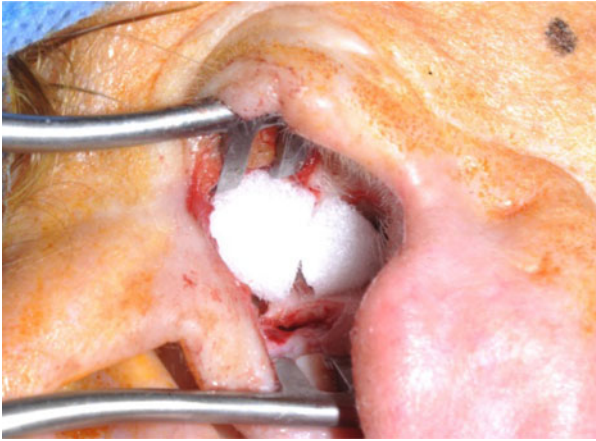


FIG. 2

Gelatin sponge in the ear canal following atticotomy.

(Spiggle & Theis Medizintechnik GmbH, Overath, Germany; Figure 1). Its dissolvable nature means that no removal is required at follow up, while it also has the added benefit of being substantially cheaper compared to other commonly used forms of packing.

Methods

The absorbable gelatin sponge comes in the form of a $10 \times 10 \times 10$ mm 'sugar cube' and can be cut with scissors to the required size and shape during the final steps of the procedure. It may then be placed on the tip of a curved needle and inserted into the external ear canal. The number of sponge cubes required is dependent on the procedure and patient's anatomy, with the aim of achieving adequate support to any grafts in situ and also coverage of the operative site (Figure 2; gelatin sponge in ear). Once in place, the sponge cubes are moistened with a few drops of dexamethasone/framycetin/gramicidin (Sofradex[®]) ear drops, although in some cases they can be placed in the ear pre-soaked as the material holds together well. Patients are discharged with instructions to apply 3 drops, three times daily to the operated ear canal for two weeks. The first follow-up review takes place six weeks post-operatively and the operated ear canal is examined for any residue of packing, signs of infection, discharge and progress of wound healing. It is used in all our ear operations, including

myringoplasty, mastoidectomy, atticotomy, canaloplasty, meatoplasty, tympanoplasty and stapedectomy.

Results

Table I compares the cost of using four common packing materials for several procedures. The absorbable gelatin sponge costs £0.84 per 1 cm^3 cube, compared to BIPP at £15.43 for 50 cm, Pope otowicks at £2.63 per wick and Spongostan Special at £10.14 for a 7×5 cm sheet. The cheaper per-unit price and the economical nature of its use mean that the absorbable gelatin sponge is a considerably cheaper form of packing for a range of otological procedures.

Over the last three years, the absorbable gelatin sponge has been used exclusively in otological procedures by the lead otology consultant across our Trust, a regional ENT centre. During this time, a total of 492 procedures have been performed at the William Harvey Hospital, with 254 tympanoplasties, 109 atticotomies, 67 mastoidectomies, 53 stapedectomies and 9 meatoplasties. Of the few complications that developed in these patients, all were associated with the procedure itself; no adverse outcomes were directly associated with the use of the absorbable gelatin sponge.

Discussion

The major benefit of the absorbable gelatin sponge is that no removal is required in the out-patient clinic as the material dissolves completely within two weeks with the use of antibiotic ear drops. The ear drops are applied twice a day into the ear canal and onto the gelatin sponge, where they have a combined action. The gelatin sponge allows direct and even delivery of the topical antibiotic to the surgical site, while the ear drop acts as a medium into which the gelatin sponge can slowly dissolve. It takes up to two weeks for the gelatin sponge to fully dissolve away with twice daily use of common ear drops, such as Sofradex, which conveniently facilitates the standard two-week course of ear drops that we advise for our patients. Our experience at the out-patient review after this period is that no residue of the sponge can be found in the operated ear canal.

Another key benefit of using the absorbable gelatin sponge is cost. It is much cheaper compared to the higher cost of BIPP, Pope otowicks and Spongostan Special (Table I). The standard, and larger, sizes of the BIPP tapes (100 cm long) and Spongostan Special sheets ($7 \times 5 \times 0.1$ cm) result in large amounts of packing being discarded

TABLE I
ACTUAL COSTS OF PACKING, BASED ON PROCEDURE AND TYPE OF PACK USED

Procedure	Packing material			
	Bismuth iodoform paraffin paste (BIPP)	Pope otowick	Absorbable haemostatic gelatin sponge (Spongostan Special)	Absorbable gelatin sponge
Stapedectomy	£15.43 (1)	£2.63 (1)	£10.14 (1)	£0.84 (1)
Tympanoplasty	£15.43 (1)	£5.26 (2)	£10.14 (1)	£0.84 (1)
Meatoplasty	£15.43 (1)	£5.26 (2)	£10.14 (1)	£1.68 (2)
Atticotomy	£15.43 (1)	£10.52 (4)	£10.14 (1)	£3.36 (4)
Mastoidectomy	£15.43 (1)	£10.52 (4)	£10.14 (1)	£3.36 (4)

The numbers in brackets show the number of pack(s) required according to the procedure used.

when a procedure requires only small amounts of packing material, whereas the smaller size and easy-to-manipulate nature of the absorbable gelatin sponge means that less material is wasted. In addition, the absorbable nature of the gelatin sponge avoids the risk of tissue ingrowth and adherence into the packing material, which can occur with BIPP and Pope otowicks, especially after prolonged in-situ use.

Conclusion

In summary, we advocate the use of the absorbable gelatin sponge, an effective and economical packing material, within routine otological surgical practice. Compared to other types of ear packing available, it is as effective with respect to surgical outcomes, kinder to patients and substantially cheaper. In these difficult times, where National Health Service resources are limited and all departments are required to make considerable cutbacks, we have demonstrated how, through the use of simple products, we can deliver an excellent and cost-effective service.

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Address for correspondence:

Mr S Fang, Department of Otolaryngology,
William Harvey Hospital,
Kennington Road, Willesborough, Ashford, TN24 0LZ,
United Kingdom

E-mail: fang@doctors.org.uk

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