The Journal of Laryngology & Otology

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The use of modified Montgomery T-tubes as frontal sinus stents: how I do it

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Abstract

Background. Frontal sinus surgery is challenging as the frontal recess is prone to re-stenosis and there is subsequent occlusion of the frontal sinus outflow tract. In an attempt to maintain the frontal recess calibre and reduce frontal sinus re-stenosis, frontal sinus stents have been used with different materials and varying results.

Objective. This paper presents the technique of using a modified Montgomery T-tube as a frontal sinus stent.

Results and conclusion. The use of a soft, self-retaining and non-absorbable stent that can be used for stenting of the frontal sinus is described. Our technique is safe, effective, inexpensive and well tolerated.

Short Communication

Dr F Bandino takes responsibility for the integrity of the content of the paper

Cite this article: Bandino F, Bates J, Qureishi A, Martinez-Devesa P. The use of modified Montgomery T-tubes as frontal sinus stents: how I do it. *J Laryngol Otol* 2022;**136**: 1328–1329. https://doi.org/10.1017/S0022215122000330

Accepted: 24 January 2022
First published online: 31 January 2022

Key words:
Sinusitis; Paranasal sinuses; Endoscopy; Stents; Stenosis

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Introduction

Functional endoscopic sinus surgery (FESS) is a well-accepted and effective procedure in treating chronic rhinosinusitis; however, FESS of the frontal sinus is complicated by difficulties in maintaining the patency of the frontal sinus after sinusotomy,[1] and it has been shown to have the lowest success rate compared to the other sinuses.[2]

In order to improve the outcome, frontal sinus stents have been used since the early 1900s;[3] numerous materials and techniques have been described, and, so far, there is no consensus.

This paper describes our experience with the use of a modified Montgomery T-tube as frontal sinus stent.

Technical description

Endoscopic sinus surgery with frontal sinusotomy (Draf I, II or III procedure) is performed in each case according to the surgical need of the patient to obtain the maximum diameter of the frontal sinus opening at the end of the procedure; the sinusotomy diameter is measured with the use of instruments.

The paediatric Montgomery T-tube stent of the correct diameter (range, 6–9 mm; Figure 1) is cut to shape ('straight' if a Draf I, IIa or IIb procedure, or 'Y-shaped' if a Draf III procedure; Figures 1 and 2) and introduced intranasally under endoscopic vision; it is then advanced into the frontal recess using the corrugation on the walls of the stent to anchor it to the sinusotomy opening. The lower end of the stent should not be below the level of the middle turbinate.

Patients are advised to use regular post-operative medical care practices (saline douches, topical steroids and a course of antibiotics). Patients also undergo routine post-operative debridement in the out-patient department.

The duration of stenting depends on the indication for the surgery.

Discussion

The complexity of the surgery for chronic rhinosinusitis of the frontal recess is reflected by the total number of procedures and techniques described.[4] Regardless of the procedure performed, one-third of the patients will have recurrent disease requiring revision surgery.[3,5]

The frontal recess is, indeed, prone to re-stenosis and this affects the ventilation of the sinus and the accessibility of topical medical therapy.[2] One of the reasons behind these high failure rates seems to be the abnormal scarring, often due to a lack of mucosal preservation during the surgery.[1]

In order to prevent these problems, the use of sinus stents has long been described, with the aims of preventing synechial formation, occupying space that would otherwise be filled with blood, fibrin and/or mucus, and providing a matrix for epithelial migration at the same time.[6]

Numerous types of stent have been described, including absorbable and non-absorbable, self-retaining or non-self-retaining, soft and rigid. However, the different types of stents described have varying results; so far, there are no universally accepted

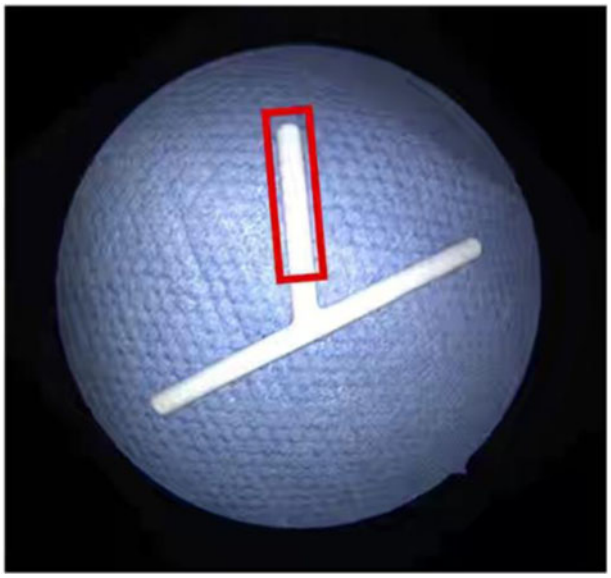

Fig. 1. Paediatric Montgomery T-tube; red lines demonstrate the method of cutting the 'straight' stent used for Draf I, IIa and IIb procedures.

indications.[5,7] The majority of the authors of previous studies favour six-month stenting in order to allow good and stable re-mucosalisation.[1,2,8] Authors favouring a stent technique claim a success rate ranging from 80 to 94 per cent.[3,6,9]

Our technique offers the advantage of a soft stent,[2,5] which is well tolerated by the patients; because of its shape, the stent is self-retaining and does not require any sutures. The procedure described here is inexpensive, cost-effective, simple and can be easily performed by experienced endoscopic sinus surgeons.

Although our follow up is normally clinical with flexible nasendoscopy examination, the stent is radiopaque and its position can be easily visualised with computed tomography imaging (Figure 2).

The senior author of this paper has been using the technique described for 10 years and reports no major complications related to it. In our series, the duration of stenting was nine months on average, with most patients (about 80 per cent) having a patent frontal recess on evaluation with flexible nasendoscopy after removal. We found that the need for stenting is actually quite rare (in our series, only about 2 per cent of all the procedures performed in the frontal sinus involved stenting). The stent can be easily removed under local anaesthesia in-office at any time.

Competing interests. None declared

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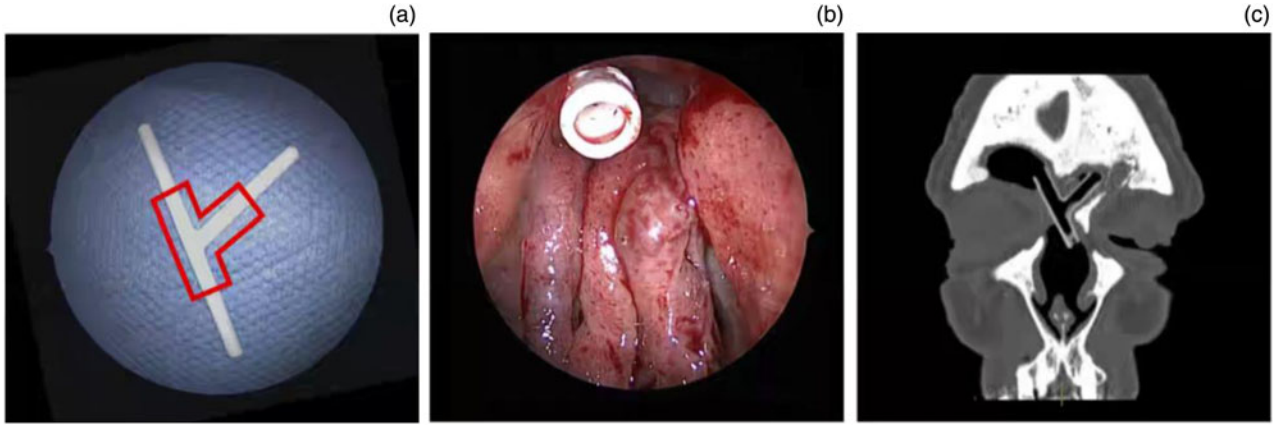

Fig. 2. 'Y-shaped' paediatric Montgomery T-tube used for Draf III procedures: (a) method of cutting the stent (indicated by the red lines); (b) endoscopic appearance; and (c) radiological computed tomography appearance in the coronal plane.

https://doi.org/10.1017/S0022215122000330 Published online by Cambridge University Press