Clinical applications of polytetrafluoroethylene (PTFE) tape in restorative dentistry

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Introduction

Polytetrafluoroethylene (PTFE) is a polymeric material that has common uses outside of dentistry. Its applications include incorporation into cookware and building materials as well as within circuitry and components for computers. In dentistry it has been used for purposes of guided tissue regeneration, the coating of instruments to improve handling properties and clear-based matrices. More recently the use of PTFE for purposes of screw access channel filling has been described.

PTFE is relatively inert; as such it is capable of resistance to solvents and acids, therefore will not degrade when used with dental etchants. PTFE also has a low static and kinetic coefficient of friction (0.1) ensuring a ‘non-stick’ application and removal without leaving behind a residue. Due to PTFE’s ‘high break elongation’ it is capable of being stretched up to 400% of its original length without tearing. As such the material can be stretched and adapted closely to different surfaces and manipulated without the risk of being destroyed. Despite the material being available in thin sections (30–120 μm) it does not significantly lose its shear strength (Fig. 1). In addition to excellent insulating properties, PTFE has a high melt viscosity (approximately six times that of most fluoropolymers) which allows the tape to be sterilised for dental purposes in an autoclave (Fig. 2).

These qualities suggest a number of potential uses in restorative dentistry.

Restorative dental procedures are ever developing; one reason for this can be attributed to newer materials with better handling properties and our ability to manipulate them more effectively. As a result various techniques have been described to aid clinicians in obtaining predictable results in restorative dental procedures. This article aims to review the use of plumber’s tape to assist in adhesive, endodontic and implant related dental procedures, when compared to other available materials.

In brief

- Compares the use of plumber’s tape to existing dental materials and discusses potential areas where it can be used as an alternative to assist in restorative dental procedures.
- Provides clinicians of all experience levels with exposure to an alternative dental material along with some techniques for its use.
- Outlines the use of a simple, cost effective and readily available material to enhance restorative dental procedures, further expanding the clinician’s armamentarium.

Fig. 1 Spools of PTFE tape purchased from a local hardware store. The white casing represents a thinner gauge used for sealing water pipe threads. The yellow case below has a double thickness tape, which is utilised for sealing gas pipe threads

Fig. 2 A strip of PTFE tape supported by a tongue depressor within a sterilisation pouch, after being autoclaved. The PTFE tape remains unchanged due its high melt viscosity