Intralesional Cryosurgery for the Treatment of Severe Stoma Hypergranulation Following Percutaneous Endoscopic Gastrostomy

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Percutaneous endoscopic gastrostomy (PEG) insertion is reported to be performed in 125,000 to 200,000 of cases in the United States annually [1]. Hypergranulation tissue is common after PEG insertion with reported occurrences of above 50% [2]. The treatment options specific for hypergranulation at gastrostomy sites include the application of silver nitrate, combined antibiotic and steroid ointment, Lyofoam T® (Mölnlycke Health Care Limited, Bedfordshire, UK); as a last resort, it may be necessary to consider resiting the gastrostomy. A Medline search revealed that cryosurgery has not been reported as a treatment modality for hypergranulation tissue at gastrostomy stoma; in fact there is no description of the use of cryosurgery for treating hypergranulation tissue in general.

In this report we describe the case of a 10 year old boy with the rare cardio-facio-cutaneous syndrome who presented with a rapid sizable growth of hypergranulation tissue around the stoma of his PEG. The hypergranulation tissue was successfully treated by intralesional cryosurgery where other treatment modalities had failed.

Y.H.S. has a financial interest in the intralesional cryosurgery technology

PATIENT DESCRIPTION

A 10 year old boy known to have the rare cardio-facio-cutaneous syndrome presented to our outpatient clinic with a significant rapid sizable growth of hypergranulation tissue around the stoma of his PEG [Figure 1A]. The patient was experiencing severe pruritus and discomfort with con-

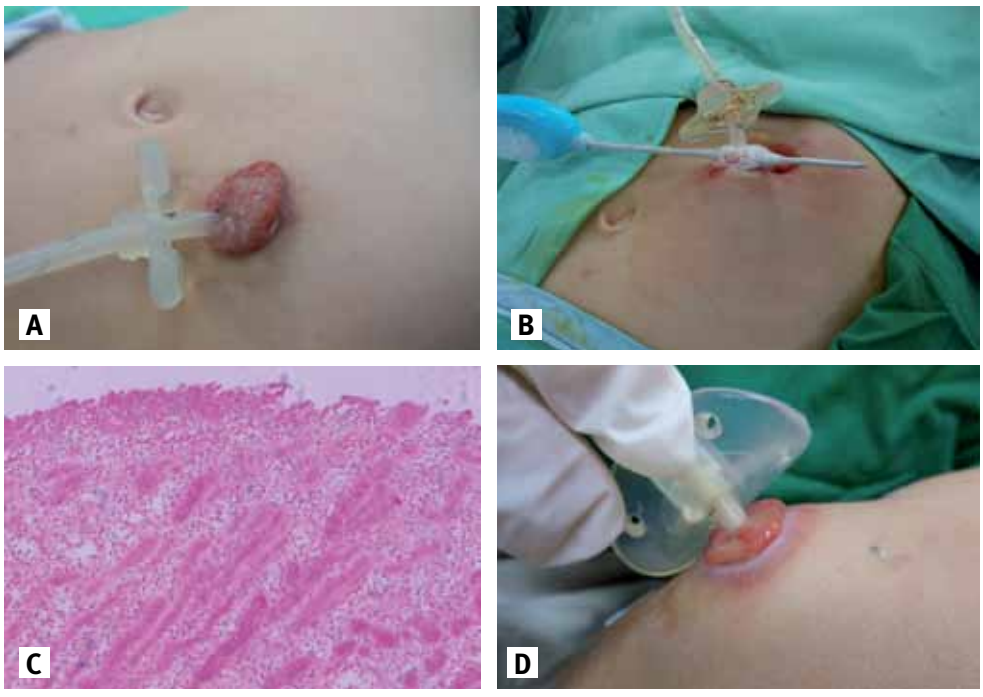

Figure 1. [A] Preoperative photo demonstrating a rapid and sizable growth of hypergranulation tissue around the stoma of the PEG

[B] Cryoneedle introduced in an intralesional approach into the granulation tissue around the stoma to freeze the proliferating tissue

[C] Pathologic examination revealed granulation tissue with acute and chronic inflammatory cells, congested blood vessels and newly formed fibroblasts embedding collagen fibers (H&E, x200)

[D] Significant reduction of the hypergranulation tissue with no recurrence at 1 year follow-up

stant scratching of the lesion and recurrent bleeding for about 4 months, preventing the attachment of a stoma bag. The hypergranulation tissue evolved rapidly during 6 weeks following the PEG insertion, with no improvement under local conservative treatment which included repeated application of silver nitrate and combined antibiotics and steroid ointments.

Since no conservative approach was successful and the patient was suffering severely from the condition, an excision of the proliferating tissue was attempted but a week later the hypergranulation tissue recurred. The option of re-siting the gastrostomy was recommended, keeping in mind the high probability of recurrence. The parents declined this possibility and consulted us regarding a different approach. We proposed treating the hypergranulation with cryosurgery using the intralesional approach in the hope that our suggestion of cryosurgery would solve the problem. Under general anesthesia the hypergranulation tissue was frozen by intralesional cryosurgery (CryoShape, Etgar Group Ltd., Kfar Saba, Israel) [3,4]. The cryo needle, which was connected by an adaptor to a cryogun (CryoPro Maxi 500 ml, Cortex Technology, Hadsund, Denmark) filled with liquid nitrogen, was introduced in an intralesional approach into the granulation tissue [Figure 1B]. Three needle insertions around the stoma were needed to assure that the entire hypergranulation tissue was completely frozen. The freezing process, which lasted 20 minutes, was stopped after the ice-ball had extended for 5 mm beyond the hypergranulation tissue borders to the normal skin (halo) to assure the destruction of all proliferating tissue. Biopsies of the hypergranulation tissue confirmed the clinical diagnosis of hypergranulation tissue [Figure 1C] and ruled-out prolapse of gastric mucosa.

The patient was discharged after 24 hours with recommendations for general wound care with soap and water and local antibacterial cream. The frozen tissue became necrotic and the crusts fell off after 2 weeks.

A 1 year follow-up revealed a significant resolution of the hypergranulation tissue with no recurrence [Figure 1D]. No adverse events were noted secondary to the intralesional cryosurgery treatment.

COMMENT

The etiology of hypergranulation tissue is not entirely understood; suggested predisposing factors include excessive moisture, trauma or friction on the wound surface, and healing by secondary intention. Although there is little evidence to support superiority of any single treatment over another, a review of current practice suggests that clinical practice and patient outcome in this area of care can be improved [5]. Reported treatments for hypergranulation tissue include a thorough evaluation and treatment of the infection, minimizing external irritation, changing to a less occlusive dressing, applying topical steroids (medium to high potency), silver nitrate, laser ablation and excision.

Cryosurgery is a common office procedure for the treatment of a variety of skin and other lesions. The mechanism of destruction in cryosurgery is necrosis, which results from the freezing and thawing of cells, and can be divided into three phases: a) heat transfer, b) cell and blood vessels injury, and c) inflammation. Intralesional cryosurgery consists of an elongated double-lumen un-insulated needle with a safety vent and a sharp-cutting, sealed, distal tip. The proximal end of the cryoprobe is attached to an adaptor, which is connected to a cryogen source. By forcing liquid nitrogen to circulate through the needle, an ice-ball around the cryoneedle develops causing the abutted tissue to be completely frozen [3,4]. This intralesional cryosurgery technique, a new and evidence-based method, has been extensively employed to treat hypertrophic scars and keloids with significantly successful clinical results.

To our knowledge, this case report is the first in the medical literature to describe the use of intralesional cryosurgery as a treatment modality for hypergranulation tissue. Our patient experienced an immediate significant resolution of the excessive granulation tissue with no recurrence during 1 year after a single treatment of intralesional cryosurgery. Our case supports the use of cryosurgery as an effective single treatment modality. This approach may be added to the armamentarium of methods to treat hypergranulation tissue.

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"Intelligence is the ability to adapt to change"

Stephen Hawking (born 1942), English theoretical physicist, cosmologist, author and Research Director at Cambridge University. He is an Honorary Fellow of the Royal Society of Arts, a lifetime member of the Pontifical Academy of Sciences, and a recipient of the Presidential Medal of Freedom, the highest civilian award in the United States. His book *A Brief History of Time* stayed on the British Sunday Times bestseller list for a record-breaking 237 weeks. Mr. Hawking suffers from a rare early-onset, slow-progressing form of amyotrophic lateral sclerosis (ALS), that has gradually paralyzed him over the decades. He now communicates using a single cheek muscle attached to a speech-generating device. The recent movie *The Theory of Everything* is based on his life