Intranasal Diprospan Injection for Chronic Rhinosinusitis Treatment: Two Case Reports

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Abstract

Chronic rhinosinusitis with nasal polyposis (CRSwNP) affects 0.5–4% of the world population and is present in ~20% of patients with CRS. There are no definitive guidelines for the treatment of CRS largely due to the lack of consensus on the etiology of the disease. The management of chronic rhinosinusitis with nasal polyps, aimed at improving clinical symptoms, includes both surgical and medical treatments, but there is no universally accepted management protocol. Two case reports of CRSw NP treatment by intranasal Diprospan injection are presents. In both cases significant clinical and radiological improvement was observed without any side effects.

Keywords: Chronic rhinosinusitis; Nasal polyposis; Diprospan injection

Abbreviations: CRS: Chronic Rhinosinusitis; CRSwNP: Chronic Rhinosinusitis with Nasal Polyposis; INCSs: Intranasal Corticosteroids; CT: Computed Tomography

Introduction

Chronic rhino sinusitis with nasal polyposis (CRSwNP) affects 0.5–4% of the world population and is present in ~20% of patients with CRS [1-6]. Rhinosinusitis is defined as a sudden onset of two or more symptoms, one of which should be either nasal blockage or nasal discharge (anterior or posterior nasal drip). Other symptoms are facial pain or pressure, and impairment or loss of smell [7-9]. It is also important to gauge the severity of the patient’s condition as well as the impact on the patient’s quality of life. The pathogenesis of CRS remains controversial. Multifactorial factors altering the host-environment interaction such as bacteria, fungi, viruses, allergens, or environmental toxins may trigger the inflammatory process [10]. That is why there are no definitive guidelines for the treatment of CRS largely due to the lack of consensus on the etiology of the disease [2]. The management of chronic rhino sinusitis with nasal polyps, aimed at improving these symptoms, includes both surgical and medical treatments, but there is no universally accepted management protocol [11]. Topical treatment with intranasal corticosteroids (INCSs) has been widely used to control disease symptoms in patients with CRSwNP. INCSs can be classified as modern (mometasone, fluticasone, and ciclesonide) versus first-generation corticosteroids (budesonide, beclomethasone, betamethasone, triamcinolone, and dexamethasone). Effectiveness of INCSs depends on type, dose, delivery method (i.e., nasal spray, drops, direct irrigation of the sinuses, catheters, and atomizer), and length of the treatment. However, the constant use of nasal sprays or drops causes the patient lots of inconveniences and impacts the quality of life, especially for people living active lifestyle.

The purpose of this study is to present two case reports of CRSwNP treatment by intranasal Diprospan injection.

Case Report 1

A 62-year old female patient was referred to the department of ENT and Maxillofacial Surgery of “Heratsy” No 1 University Hospital on September 2015 with complaint on persistent headache, facial pain, nasal congestion, rhino rhea with clear mucous discharge, difficulty breathing through nose, loss of smell, dyspnoea, general malaise, cough and lower extremities edema.

She had a history of radical bilateral Coldwell-Luc operation 7 years ago, which was carried out on the occasion of chronic sinussinusitis with polyposis. Acute cerebrovascular accident in 2010, hypertension, asthma and cardio-pulmonary insufficiency were noted by the patient.

Anterior rhinoscopy showed large polyps, which grow down to nasal cavities external opening. Nasal mucosa was bluish with clear mucus.

Coronal CT scan showed appearance of sinonasal polyposis with polypoid soft tissue masses within nasal cavity and paranasal sinuses. Opacification of all paranasal sinuses with the nasal cavity filled with polyps was observed (Figure 1a).

As a treatment of choice medical therapy was carried out. Injection of 1 ml Diprospan solution was done in the lateral wall of nasal cavity. Intranasal insulin needle prick conducted at a depth of 3-4 mm from the external nasal opening in the region of mucodermal fold. Aspiration probe was necessary before injection.

On control examination after one week patient noted, that had less facial pain, headache and rhinorrhea. Anterior rhinoscopy showed a decrease in polyps' sizes. The second injection with the same technique was done.

The next examination was done in a month. She already did not have any complains and noted, that she could smell. The last injection was done and the patient was appointed for clinical and CT scan examination in two months.

On her last examination she did not have any complains. She noted...
Medical therapy was carried out. Injection of 1 ml Diprospan solution was carried out by the scheme presented above (first day, one week, and one month).

On control examination after one week the patient noted, that had less headaches and rhinorrhea. Anterior rhinoscopy showed a decrease in polyps’ sizes. After one month he already did not any complains and noted good smelling. Three months after the last injection the patient was appointed for control clinical and radiological examination.

He did not have any complains, noted excellent breathing, smelling, and absence of rhinorrhea.

Coronal and axial CT scan showed pneumatization of all sinus and several residual small soft tissue masses in the nasal cavity (Figure 2b).

Case Report 2

A 28-year old male was referred to the department of ENT and Maxillofacial Surgery of “Heratsy” №1 University Hospital on August 2015 with complaint on persistent headache, nasal congestion, rhinorrhea with anterior and posterior discharge, inability to nasal breathing and loss of smell. He gave a history of disease first manifestations in 2012.

Anterior rhinoscopy reveals pale, grey polyloid masses arising middle meatus and prolapsing into the nasal cavity.

Coronal and axial CT scan showed appearance of sinonasal polyposis with polyloid soft tissue masses within nasal cavity and paranasal sinus. Opacification of all paranasal sinus with the nasal cavity filled with polyps and nasal septum deviation was observed (Figure 2a).

Medical therapy was carried out. Injection of 1 ml Diprospan solution was carried out by the scheme presented above (first day, one week, and one month).

On control examination after one week the patient noted, that had less headaches and rhinorrhea. Anterior rhinoscopy showed a decrease in polyps’ sizes. After one month he already did not any complains and noted good smelling. Three months after the last injection the patient was appointed for control clinical and radiological examination.

He did not have any complains, noted excellent breathing, smelling, and absence of rhinorrhea.

Coronal and axial CT scan showed pneumatization of all sinus and several residual small soft tissue masses in the right ethmoidal sinus (Figure 2b).

Discussion

CRS is a common health problem which significantly affects quality of life [6,7,10].

CRS, with or without nasal polyps in adults is defined as inflammation of the nose and the paranasal sinuses characterized by...
two or more symptoms, one of which should be either nasal blockage/obstruction/congestion or nasal discharge (anterior/posterior nasal drip) ± facial pain/pressure ± reduction or loss of smell for ≥ 12 weeks [10,12]. In addition to history, physical signs are important criteria in the diagnosis of CRS. This should be supported by demonstrable disease with endoscopic signs of nasal polyps, and/or mucopurulent discharge primarily from middle meatus and/or edema/mucosal obstruction primarily in middle meatus [10].

Anterior rhinoscopy is a noninvasive means of viewing the nasal mucosa [13]. However, it is difficult to view beyond the anterior portion of the nasal passages, even after administration of topical decongestants. Nasal endoscopy, although more invasive, is a preferable method for obtaining a magnified view of the nasal mucosa, turbinates, and interior of the nasal airway in the preoperative and post-surgical patient. Endoscopy aids in assessing the integrity of the mucosa, as well as directly seeing mucosal changes, polyps, crusting, and/or discharge. Cultures can also be obtained endoscopically [13]. Discolored nasal discharge, polyps, or polypoid swelling seen with anterior rhinoscopy or endoscopy, and edema or erythema of the middle meatus or ethmoid bulla seen on endoscopy, are consistent with CRS [2,14]. In Case 1 patient polyps are closed both nasal passages and endoscopically was possible to view only 1,5 cm of the nasal passage depth. Radiologic imaging is necessary to view the sinuses and to make or confirm the diagnosis of CRS [2,5]. Plain film X-rays have not been proven to be useful in CRS. Computed tomography (CT) scanning is the imaging method of choice. Direct coronal CT affords an excellent view of the bony structures and mucosal lining. These coronal CT scans are indicated in patients with recurrent sinusitis or CRS in order to properly consider treatment options and sequence the steps in the evaluation. In surgical candidates, CT scanning clearly defines the surgical anatomy and the extent of the disease process [13]. Mucosal thickening, bony changes, or air-fluid levels seen on CT are consistent with CRS [2]. There are instances when lateral or axial imaging is required to determine the extent of the disease process. Magnetic resonance imaging (MRI) is not recommended for diagnosis of CRS due to its lack of specificity [2].

![Figure 2: CT paranasal sinuses of Case 2 patient: a- before treatment, b- after treatment.](image-url)
Surgery has long been a treatment of choice for persistent CRS, and with the advent of endoscopy, most surgeries are now minimally invasive. Although studies have shown positive outcomes from surgery, with subjective improvement ranging from 70% to 98% of patients, surgery does not necessarily cure the disease and should be considered as an adjunct to medical therapy. However, when it comes to CRS with sinonasal polyposis, postoperative recurrence often occurred, even when aeration is improved [15-17]. And medical treatment is often still required after surgery [6,18]. For Case 1 patient the recurrent was observed after Coldwark Luk and ethmoidal polypectomy operation and it is necessary to note her asthmatic component.

Randomized controlled trials compared the efficacy between surgery and medication in CRS. Ragab et al. [19] showed no difference in total symptom scores in the medication group (erythromycin plus nasal steroid plus nasal douche) and surgical group (endoscopic sinus surgery plus nasal steroid plus nasal douche). The Cochrane review suggested that functional endoscopic sinus surgery has not been demonstrated to confer additional benefits to those obtained by medical treatment [20]. Piromchai et al. [10] recommend surgical intervention only when there is no response to maximal medical treatment.

Topical treatment with intranasal corticosteroids (INCSs) has been widely used to control disease symptoms in patients with CRSwNP [16,21-23]. The aim of corticosteroid therapy in CRS is to reduce inflammation via directly reducing eosinophil viability and activation [24,25]. In addition, an indirect effect can reduce the secretion of chemotactic cytokines from the nasal mucosa and polypl's epithelial cells [26].

In a recently published systematic review looking at the effect of INCSs, a substantial positive effect on patients' symptoms was found [27]. INCS treatment favors the direct drug delivery to diseased mucosa and has the potential for delivering higher local drug concentrations, minimizing systemic absorption, and systemic side effects [3,4]. Effectiveness of INCSs depends on type, dose, delivery method (i.e., nasal spray, drops, direct irrigation of the sinuses, catheters, and atomizer), and length of treatment [6,28,29]. INCSs can be classified as modern (mometasone, fluticasone, and ciclesonide) versus first-generation corticosteroids (budesonide, beclomethasone, betamethasone, triamcinolone, and dexamethasone). The delivery method of topical steroids is an imperative factor. Classification of delivery methods can be divided by site (nose or paranasal sinuses), volume, and pressure. The delivery methods to the nasal site include drops, sprays, and nebulizers. However, simply applying topical steroid through the nostrils does not imply delivery of the drug into the sinus. To deliver topical medicine into the sinuses, an appropriate access and delivery is required [29]. Paranasal sinus delivery requires devices cannulated through the nose [10]. In our cases the Diprospan intranasal peri-articular, intradermal, intralesional and soft tissue injection. To deliver topical medicine into the sinuses, an appropriate access and delivery is required [29]. Paranasal sinus delivery requires devices cannulated through the nose [10]. In our cases the Diprospan intranasal peri-articular, intradermal, intralesional and soft tissue injection. Each ml of Diprospan Suspension contains 5 mg of betamethasone dipropionate and 2 mg of betamethasone as sodium phosphate in a sterile buffered vehicle. It provides a combination of highly soluble and very slightly soluble esters of betamethasone that produce anti-inflammatory, antirheumatic and anti-allergic effects. Prompt therapeutic activity is achieved by the soluble ester, betamethasone sodium phosphate, which is quickly absorbed after injection. Sustained activity is provided by betamethasone dipropionate, which is only slightly soluble and becomes a repository for slow absorption, thereby controlling symptoms over a prolonged period. The small crystal size of betamethasone dipropionate permits the use of a fine gauge needle (up to 26 g) for intradermal and intralesional administration.

In presented cases we have got clinical and radiological proved treatment of III and IV stages of CRSwNP by intranasal Diprospan injection. No adverse effects were reported by the patients in reported cases.

Conclusion

In reported cases intranasal subdermal Diprospan injection represents as a safe therapy in a primary and postoperative management of CRSwNP. Intranasal Diprospan injection showed significant improvement in patients' symptoms, clinical and radiological imagine.

References


