



SINUPLASTIA COM BALÃO

João Flávio Nogueira
Sinus Centro





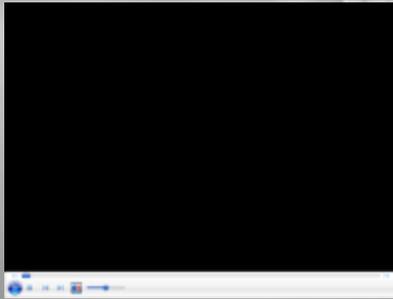


Sinuplastia ou Sinusoplastia ?

Balloon sinuplasty™



www.acclarent.com



EVOLUÇÃO: ANGIOPLASTIA E "STENTS"



Balão coronariano



Stent coronariano

1970s
1980s
1990s
2000s



2004 - Sinuplastia



Lanza DC. Postoperative care and avoiding frontal recess stenosis. In: Abstracts of the International Advanced Sinus Symposium, Philadelphia, Pa. July 1993.

5F – 7F Fogarty biliary balloon catheters

Temporary ventilation

US\$ 85,00



Am J Rhinol Allergy. 2010 Jun;24(3):110-6

Fracture of bony lamellae within the frontal recess after balloon catheter dilation.

Khalid AH, Smith TL, Anderson JC, Baza J, Sautter JB. Division of Otolaryngology-Head and Neck Surgery, Oregon Health and Science University, Portland, Oregon, USA.

The purpose of this investigation was to determine whether BCD within the frontal recess is associated with reproducible patterns of fracture in bony lamellae, to characterize changes between pre- and postintervention measurements of the frontal sinus outflow tract, and to compare the degree of change seen with endoscopic Draf I dissection.

METHODS: Eight cadaver heads underwent pre- and postintervention endoscopic visualization and computed tomography (CT) of the frontal recess and frontal sinus outflow tract. Frontal recesses were assigned for either BCD or Draf I dissection.

RESULTS: Inter-rater reliability was strong for all measures ($r > 0.77$; $p < 0.001$). The sagittal and coronal dimensions of the frontal sinus outflow tract increased significantly after BCD and Draf I dissection ($p < 0.028$).

Mean change in the sagittal dimension was significantly less after BCD compared with Draf I dissection (1.0 +/- 0.8 mm versus 4.0 +/- 1.2 mm; $p < 0.018$). The anterior face of the ethmoid bulla was the most frequently fractured lamella after BCD (56%).

CONCLUSION: The sagittal and coronal dimensions of the frontal sinus outflow tract increased significantly after BCD and Draf I dissection. A significantly greater change in dimensions of the frontal sinus outflow tract is observed after Draf I dissection compared with BCD. No orbital or skull base injury was noted with either technique.

INDICAÇÕES

Traumas

Pacientes que não podem ser submetidos a procedimentos mais extensos

Pacientes pediátricos

Barotraumas

Procedimentos híbridos (Pólipos)

Outros (Riscos de sangramentos, etc)

Rinossinusites crônicas

Otolaryngology-Head and Neck Surgery (2006) 158, 176-177

CASE REPORT

Reduction of anterior frontal sinus fracture involving the frontal outflow tract using balloon sinuplasty

Captain Kevin Hueman, MD, US Army, and Major Robert Eller, MD, USAF, San Antonio, TX



Otolaryngology-Head and Neck Surgery (2004) 156, 101-102

SHORT SCIENTIFIC COMMUNICATION

Balloon sinuplasty for the surgical management of immunocompromised and critically ill patients with acute rhinosinusitis

Marie L. Wysocki, MD, Ronald S. Becker, MD, James A. Greenavage, MD, and Paul T. Russell, MD, Nashville, TN

CONCLUSION

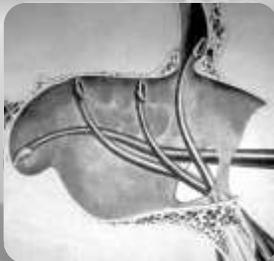
Critically ill and immunocompromised patients with acute sinus disease are exposed to potentially avoidable complications. Although these patients who fail medical management may require surgery, they are often poor surgical candidates. Balloon sinuplasty represents a potentially less invasive surgical option than standard ESS and should be considered in appropriate critically ill or immunocompromised patients.

Sinusite

Tratamento Clínico

Tratamento Cirúrgico

TRATAMENTO CIRÚRGICO



TRATAMENTO CIRÚRGICO

• Evolução microscópio



TRATAMENTO CIRÚRGICO

• Evolução endoscópico



1970s

1980s e 1990s

F.E.S.S.

TRATAMENTO CIRÚRGICO

• Objetivos

- Limpar seios bloqueados
- Restaurar drenagem e função dos SPN
- Preservar anatomia

• Limitações

- Remoção óssea e mucosa
- Sangramentos
- Fibrose cicatricial



TRATAMENTO CIRÚRGICO

Anselmo-Lima WT, Ferreira MD, Valera FC, Rossato M, de Mello VR, Demarco RC. **Histological evaluation of maxillary sinus mucosa after functional endoscopic sinus surgery.** Am J Rhinol 2007;21(6):719-24

TRATAMENTO CIRÚRGICO



At the initial surgery, patients presented **many histopathological** alterations, such as an inflammatory process infiltrating the submucosa, atypical respiratory epithelium with an important increase in goblet cells, metaplasia, or mixed epithelium.

Group 1 patients persisted with the same alterations **1 year later, but ciliary dysmorphism was more accentuated.**

Group 2 patients presented a predominantly pseudostratified epithelium, but some areas contained an increased number of goblet cells and a **reduction in the number of ciliated cells.**

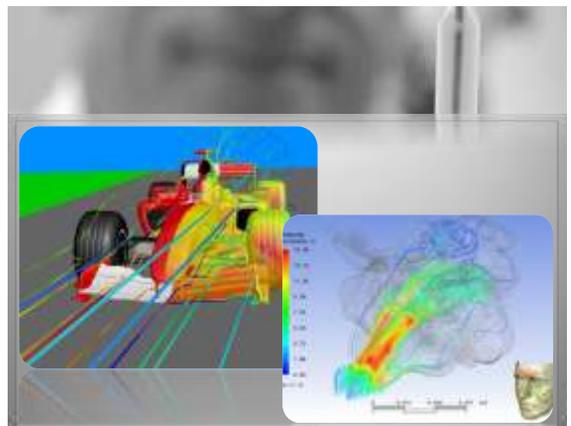
http://www.elmundo.es/elmundosalud/especiales/2005/03/galeria_cuerpo/21.html

TRATAMENTO CIRÚRGICO

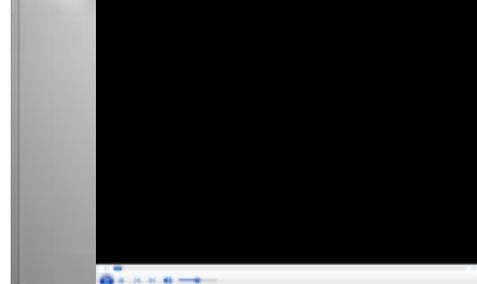
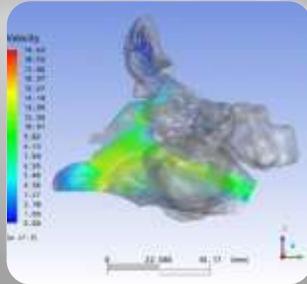
Anselmo-Lima WT, Ferreira MD, Valera FC, Rossato M, de Mello VR, Demarco RC. **Histological evaluation of maxillary sinus mucosa after functional endoscopic sinus surgery.** Am J Rhinol 2007;21(6):719-24

Conclusion:

Recovery of the maxillary sinus mucosa of patients with CRS, observed by electron and light microscopy, **was incomplete 1 year after endoscopic** surgery.

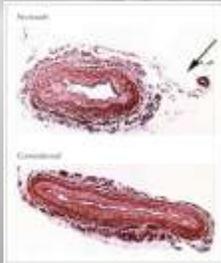


Hood CM, Schroter RC, Doorly DJ, Blenke E.J, Tolley NS. Computational modelling of flow and gas exchange in models of the human maxillary sinus. J Appl Physiol. 2009 Jul 16.



ÓXIDO NÍTRICO

- Radical livre
- NOS-2
- Resposta imune
- Infecção
 - Aumento ON
 - Vasodilatação
 - Hipotensão



ÓXIDO NÍTRICO

- Seios paranasais ?
- Seio maxilar é produtor
 - Aumento movimentos mucociliares
 - Altas concentrações
 - Protetor das vias aéreas
- Implicações cirúrgicas ?

ÓXIDO NÍTRICO

nature
medicine

Nature Medicine 1: 270-273 (1995)
doi:10.1038/10495-270

High nitric oxide production in human paranasal sinuses

J.O.N. Lundberg^{1, 2, 3}, T. Farkas-Szabasi^{1, 2}, E. Wertzberg³, I. Rander^{2, 4}, J. Uchold⁵, A. Ånggård⁴, T. Hökfelt², J.M. Lundberg¹ & K. Alving¹

© 1995 Nature Publishing Group

ÓXIDO NÍTRICO



ÓXIDO NÍTRICO

Short communication

Nasal nitric oxide, the guardian of paranasal sinuses, is paradoxically increased by high doses of intravenous glucocorticoids

Conclusions: We conclude that GCs do not decrease but even increase nasal NO

Authors: B. Dogan^{1,2}, L. Tuna^{1,2}, E. Sarvan^{1,3}, A. Günel^{1,2}, J. T. Aral⁴

Affiliations: ¹Service de Rhinologie, CHU Larrey; ²WDFM 2005, CHU Rangueil; ³Groupes de recherche en physiopathologie de l'otite moyenne et de l'otite moyenne de la Direction des Unités Neurologiques, CHU Larrey; ⁴Service d'ORL, CHU Larrey, Toulouse, France.

CIRURGIA ?



CIRURGIA ?

Pre- and Postoperative Sinus Penetration of Nasal Irrigation

Conclusions: Unoperated sinuses or cases with gross sinus ostial obstruction will not be reliably penetrated by sinus irrigant. A 3.95-mm ostial diameter seems to be the minimum size to guarantee penetration in paranasal sinuses to maximize the potential for topical sinus treatment.

CIRURGIA x ON

Kirihehe RK, Rees G, Wormald PJ. The influence of the size of the maxillary sinus ostium on the nasal and sinus nitric oxide levels. Am J Rhinol. 2002 Sep-Oct;16(5):261-4.

Background: Nitric oxide (NO) is produced in significant quantities in the nasal sinuses and is thought to have a beneficial effect on the mucociliary transport of the sinuses and nose and to have significant antibacterial properties that contribute to the health of the sinuses.

Methods: Twenty-nine patients who were post-endoscopic sinus surgery were included with 52 who were maxillary sinus ostia cannulated. There were 22 large maxillary sinus ostia and 30 small ostia. Smoking, allergy status, and topical steroid use were recorded. NO levels were measured in the nose and maxillary sinus after decongestion with patients mouth breathing and breath holding.

Results: This study shows that enlargement of the maxillary sinus ostium above its normal size (20 mm²) produces a significant decrease in both the maxillary sinus and the nasal cavity NO levels. In addition, the size of the ostium showed a significant correlation to the sinus NO level.

Minimally invasive sinus technique: what is it? Should we consider it?

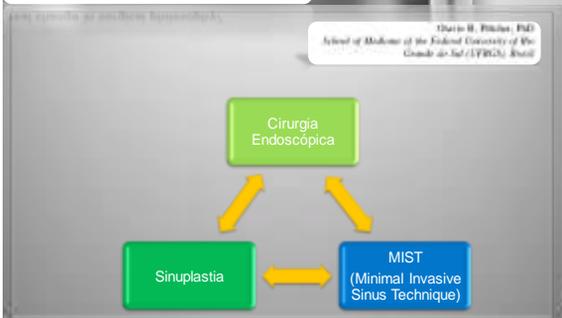
Purpose of review: To understand the timing and application of the surgical route for endoscopic sinus surgery termed minimally invasive sinus technique (MIST) in simple terms. What is MIST? When should we use it? Does it work?

Keywords: minimally invasive sinus technique, endoscopic sinus surgery

Otolaryngology-Head and Neck Surgery (2008) 130, 438-441

LETTERS TO THE EDITOR

New tools; old questions; same endpoints; any real change in surgical philosophy?



CONTRA-INDICAÇÕES

Neofomação óssea

Tumores nasais

Polipose

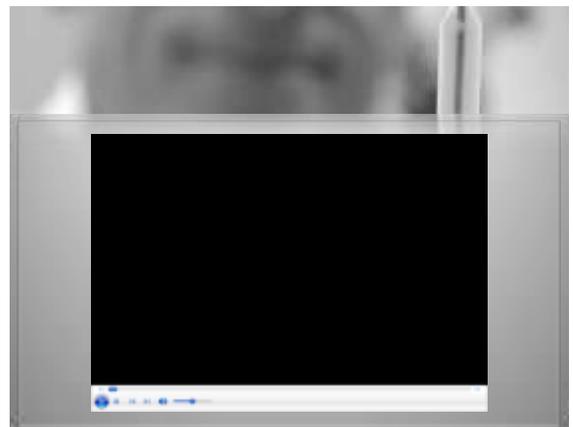
Seio hipoplásico

MATERIAL



MATERIAL







PROCEDIMENTOS HÍBRIDOS

Doctors can use stimplasty as a "pure" procedure with just the balloon technique or it can be used in a hybrid fashion —balloon remodeling along with some surgery, usually ethmoidectomy.



Setzon M. Sinuplasty gaining momentum for sinus procedures. Triological Society Annual Meeting 2007:7-8

ALTERNATIVAS À ETMOIDECTOMIA

Lavigne F, Cameron L, Renzi PM, Planet JF, et al. Intranasal administration of topical budesonide to allergic patients with chronic rhinosinusitis following surgery. *Laryngoscope*. 2002 May;112(5):858-64.

Lavigne F, Tulic MK, Gagnon J, et al. Selective irrigation of the sinuses in the management of chronic rhinosinusitis refractory to medical therapy: a promising start. *J Otolaryngol* 2004; 33(1):10-16.

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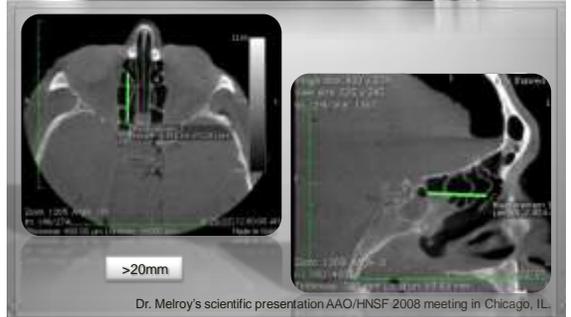
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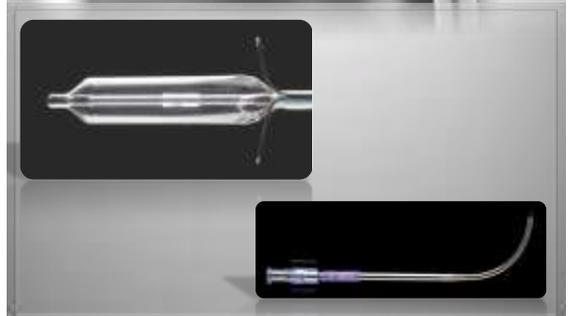
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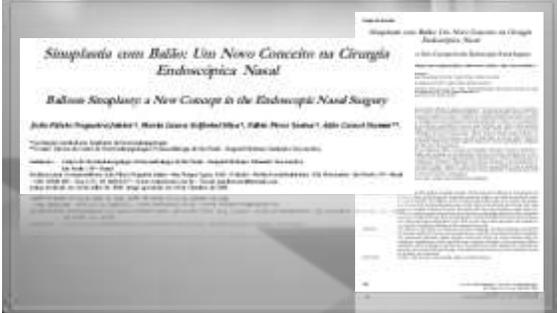
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FRONTAL SPACER



LITERATURA



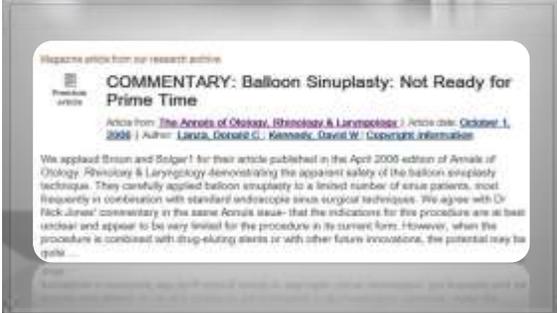
LITERATURA

Bolger & Vaughn 2006 Am J Rhin

Initial Safety and Feasibility

- **Sinuses treated**
 - 9 maxillary, 11 sphenoid and 11 frontal
 - Sinus dilatation was successful in all 31 sinuses
 - The devices easily cannulated and dilated the sinuses
 - As observed through endoscopy and CT scan the sinus ostial size achieved by the balloon catheter was comparable to the maximum balloon diameter
- **Safety**
 - Sinus ostial dilation was achieved without damage to surrounding structures
 - The orbital bone and skull base were not affected by sinus balloon dilation in this cadaver study.

LITERATURA



LITERATURA

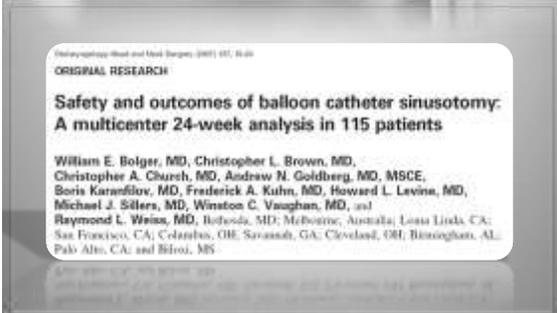
Bolger & Vaughn 2007 Otolaryngol Head Neck Surg

First In Man Study

- No complications or adverse events
- Less bleeding
- Lack of circumferential mucosal injury
- No packing required



LITERATURA



LITERATURA

Safety and outcomes of balloon catheter sinusotomy: A multicenter 24-week analysis in 115 patients

Summary of ostia patency on sinusosal endoscopy

| | Maxillary | Sphenoid | Frontal |
|------------------------------------|-----------|----------|----------|
| Postoperative week 1 total | 142 | 76 | 124 |
| Patent | 106 (75%) | 41 (55%) | 85 (69%) |
| Nonpatent | 0 | 0 | 7 (6%) |
| Indeterminate | 36 (25%) | 34 (45%) | 32 (26%) |
| Postoperative week 12 total | 116 | 54 | 98 |
| Patent | 98 (84%) | 32 (59%) | 82 (84%) |
| Nonpatent | 3 (3%) | 0 | 3 (3%) |
| Indeterminate | 15 (13%) | 22 (41%) | 13 (13%) |
| Postoperative week 24 total | 134 | 66 | 114 |
| Patent | 113 (84%) | 40 (61%) | 94 (83%) |
| Nonpatent | 1 (1%) | 0 | 1 (1%) |
| Indeterminate | 19 (14%) | 26 (39%) | 19 (17%) |

COMPLICAÇÕES



Pre-op

Thomas R, Vaughan W. Revision sinus surgery following balloon sinuplasty failure. Rhinology World, 2009

COMPLICAÇÕES



Thomas R, Vaughan W. Revision sinus surgery following balloon sinuplasty failure. Rhinology World, 2009

COMPLICAÇÕES



Post-op

Thomas R, Vaughan W. Revision sinus surgery following balloon sinuplasty failure. Rhinology World, 2009



COMPLICAÇÕES



Thomas R, Vaughan W. Revision sinus surgery following balloon sinuplasty failure. Rhinology World, 2009

CLEAR

Bolger, W., et al. Otolaryngol Head Neck Surg 2007; 137: 10-20.
Kuhn, F., et al. Otolaryngol Head Neck Surg 2006; 139: S27-S37.
Weiss, R., et al. Otolaryngol Head Neck Surg 2008; 139: S38-S46.

Objectives

- The CLinical Evaluation to Confirm SAfety and Efficacy of Sinuplasty in the PaRanasal Sinuses (CLEAR) Study was an international, multi-center, non-randomized, prospective evaluation for tracking safety and efficacy of the *Relieva Balloon Sinuplasty™* system.
- Data has been published at 6 months, 1 year, and 2 years. Goals.
- Measure efficacy by reporting on patient outcomes using a validated quality of life questionnaire (SNOT-20)

CLEAR

Bolger, W., et al. Otolaryngol Head Neck Surg 2007; 137: 10-20.
Kuhn, F., et al. Otolaryngol Head Neck Surg 2006; 139: S27-S37.
Weiss, R., et al. Otolaryngol Head Neck Surg 2008; 139: S38-S46.

Prospective, multicenter evaluation (6 centers)

Clinical assessment

- CT Scan
- Sino-Nasal Outcomes Test (SNOT-20)
- Standardized patient questionnaire

Study Group

N = 65 patients (195 sinuses)

Results

- No serious adverse events
- Revision rates at two years
 - 3.6% sinus revision rate (7/195)
 - 9.2% patient revision rate (6/65)

Statistically and clinically significant improvement in SNOT-20 scores

Patient Questionnaire

- Postoperative changes in symptoms
 - Improvement = 85%
 - Same = 15%
 - Worsened = 0%

QUESTIONAMENTOS



- Financiado
- Estudos subjetivos com escores de qualidade de vida
- Critérios subjetivos na classificação de patência de óstios
- Mas...



The Cochrane Library

Khalil HS, Nunez DA. Functional endoscopic sinus surgery for chronic rhinosinusitis. Cochrane Database Syst Rev. Jul 2006.

OBJECTIVES: Assess the effectiveness of functional endoscopic sinus surgery as a treatment for patients with chronic rhinosinusitis.

SEARCH STRATEGY: The Cochrane Ear, Nose and Throat Disorders Group Trials Register, MEDLINE (1986 to January 2006) and EMBASE (1974 to January 2006) were searched.

SELECTION CRITERIA: Randomised controlled trials.

DATA COLLECTION AND ANALYSIS: Comparisons between FESS versus medical treatment, FESS versus conventional sinus surgery

MAIN RESULTS: The three included studies were randomised controlled trials. The evidence available does not demonstrate that FESS, as practiced in the included trials, is superior to medical treatment with or without sinus irrigation in patients with chronic rhinosinusitis.

A middle meatal antrostomy fashioned by FESS was also not shown to be superior to an inferior meatal antrostomy formed by traditional sinus surgery techniques.

CONCLUSIONS: FESS as currently practiced is a safe surgical procedure. **The limited evidence available suggests that FESS as practiced in the included trials does not confer additional benefit to that obtained by medical treatment (+/- sinus irrigation) in chronic rhinosinusitis.** More randomised controlled trials comparing FESS with medical and other treatments, with long-term follow up, are required.

BMJ *Leading journal under better direction*

DOI: 10.1136/bmj.337.7829.1452

Hazardous journey

Parachute use to prevent death and major trauma related to gravitational challenge: systematic review of randomised controlled trials

George C S Smith, professor¹, Jill P Pell, consultant²

¹ Department of Obstetrics and Gynaecology, Cambridge University, Cambridge CB2 3QG. ² Department of Public Health, Greater Glasgow NHS Board, Glasgow G3 7NU



BMJ *Leading journal under better direction*

DOI: 10.1136/bmj.337.7829.1452

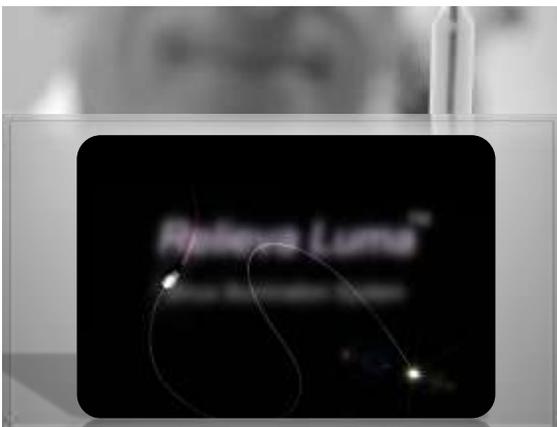
Hazardous Journey

Parachute use to prevent death and major trauma related to gravitational challenge: systematic review of randomised controlled trials

George C S Smith¹ and Jill P Pell²

Results We were unable to identify any randomised controlled trials of parachute intervention.

Conclusions As with many interventions intended to prevent ill health, the effectiveness of parachutes has not been subjected to rigorous evaluation by using randomised controlled trials. Advocates of evidence based medicine have criticised the adoption of interventions evaluated by using only observational data. We think that everyone might benefit if the most radical protagonists of evidence based medicine organised and participated in a double blind, randomised, placebo controlled, crossover trial of the parachute.

CLINICAL TECHNIQUES AND TECHNOLOGY

Using image guidance tracking during balloon catheter dilation of sinus ostia

Douglas Leventhal, MD, Ryan Heflinger, MD, and Marc Rosen, MD, Philadelphia, PA




TREINAMENTO

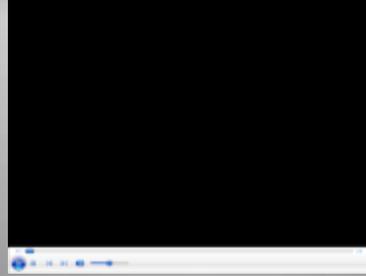
Otolaryngology-Head and Neck Surgery (2009) 149, 300-303

ORIGINAL RESEARCH—SINUSNASAL DISORDERS

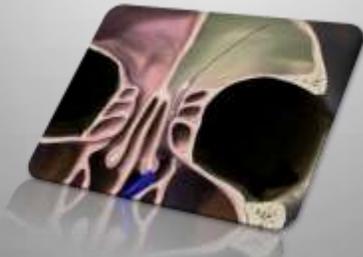
Feasibility of balloon dilatation in endoscopic sinus surgery simulator

Aldo Stamm, MD, PhD, Joao Flavio Nogueira, MD, and Marcos Lyra, MD, São Paulo, Brazil

TREINAMENTO



CASOS - SINUPLASTIA



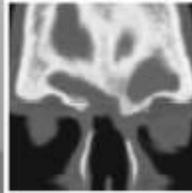
CASO 1

CASE 01:

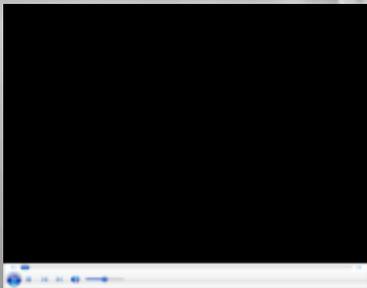
Male, 54 years old, recurrent frontal sinus disease.

Undergone to several endoscopic surgeries at the frontal sinus and recess area, including a DRAF III procedure.

Chronic inflammatory disease that promotes scarring and stenosis at the area.



CASO 1



CASO 1

CASE 01:

Evolution with stenosis of the area.

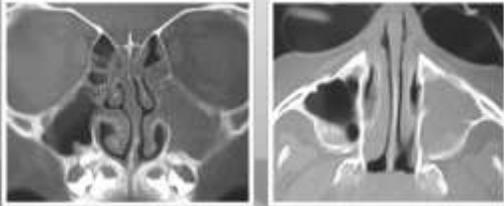
Two months later, frontal abscess.

Undergone to endoscopic surgery with aperture of the area with a new Draf III procedure.

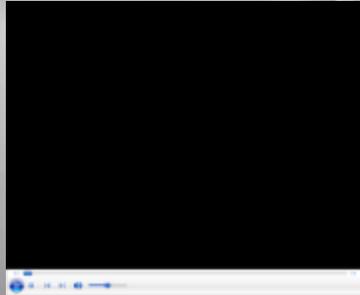
CASO 2

CASE 02:

Male, 7 years old, left maxillary chronic rhinosinusitis.

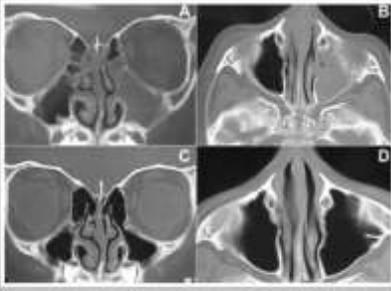


CASO 2



CASO 2

6 months post-operative



CASO 3

CASE 03:

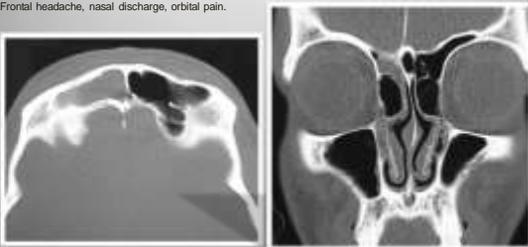
Male, 21 years old, right frontal chronic rhinosinusitis.
Frontal headache, nasal discharge, orbital pain.



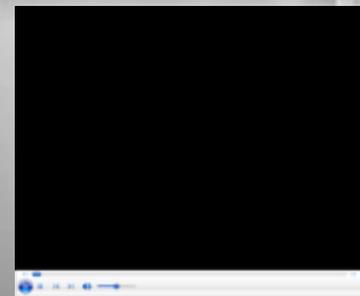
CASO 3

CASE 03:

Male, 21 years old, right frontal chronic rhinosinusitis.
Frontal headache, nasal discharge, orbital pain.



CASO 3

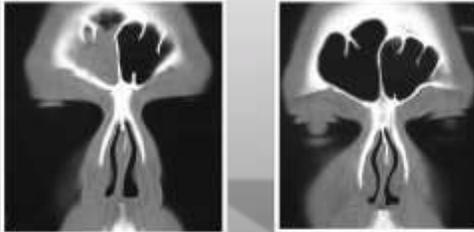


CASO 3

3 months post-operative

CASE 03:

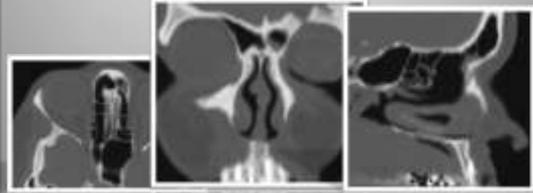
Excellent evolution with no clinical symptoms until now.
Patient refers improvement of the headache, nasal discharge and orbital pain.



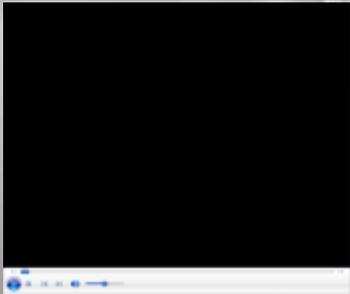
CASO 4

CASE 04:

Female, 32 years old, recurrent left frontal sinus disease.
Undergone to nasal endoscopic surgery 2 years ago.
Good evolution, however clinical complaints of nasal discharge, frontal headache and orbital pain.



CASO 4

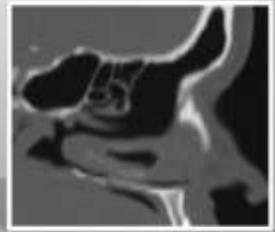


CASO 4

3 months post-operative

CASE 04:

Excellent evolution with no clinical symptoms until now.
Patient refers improvement of the headache, nasal discharge and orbital pain.



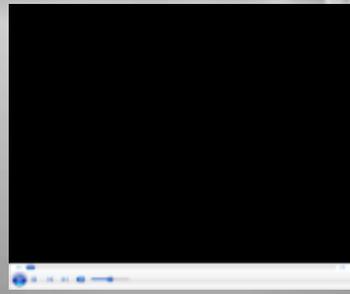
CASO 5

CASE 05:

Female, 17 years old, chronic right maxillary sinus disease.
Complaints of nasal discharge and facial pain.



CASO 5

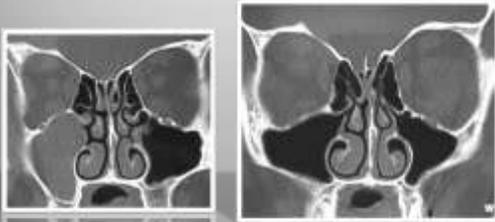


CASO 5

3 months post-operative

CASE 05:

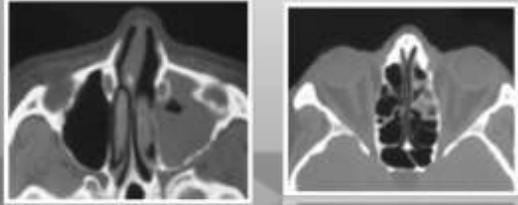
Excellent evolution with no clinical symptoms until now.
Patient refers improvement of the facial pain and nasal discharge.



CASO 6

CASE 06:

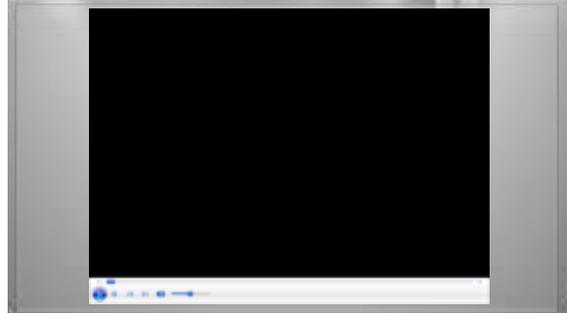
Female, 58 years old, 9 months ago underwent to a dental implant procedure.
1 month after the dental implant, left maxillary pain, nasal discharge and headaches.
Treated with ATB + Steroids



CASO 6



CASO 6



CASO 6

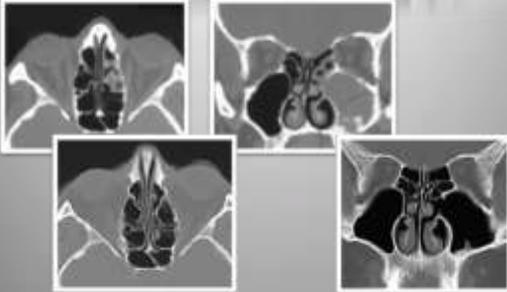


CASO 6



CASO 6

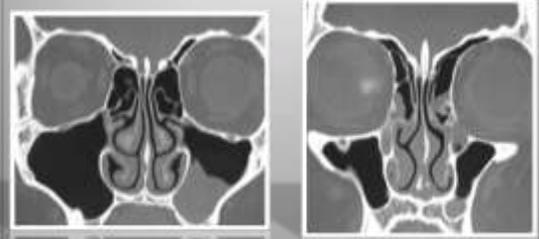
2 months post-operative



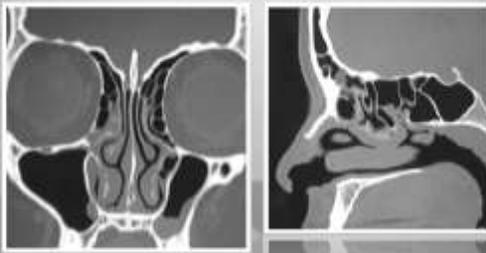
CASO 7 - CURITIBA

CASE 07:

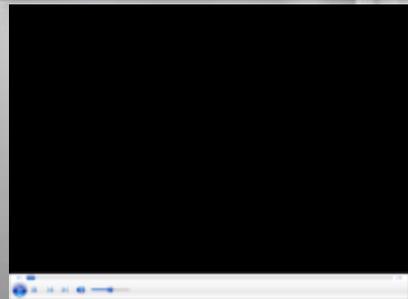
Female, 30 years old, chronic maxillary and frontal sinus disease. Complaints of nasal discharge and facial pain.



CASO 7 - CURITIBA



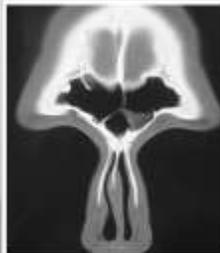
CASO 7 - CURITIBA



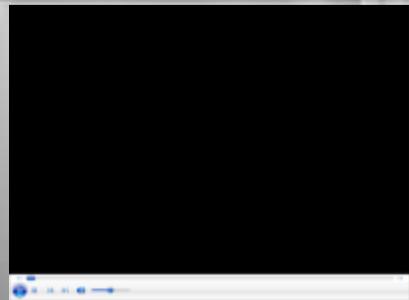
CASO 8

CASE 08:

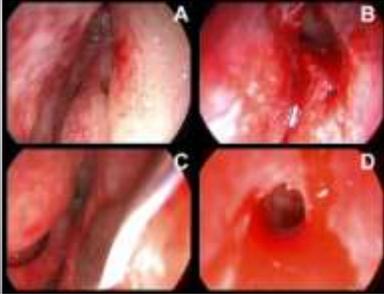
Male, 25 years old, nasal obstruction and frontal headache.



CASO 8



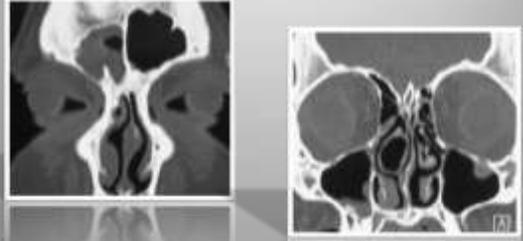
CASO 8



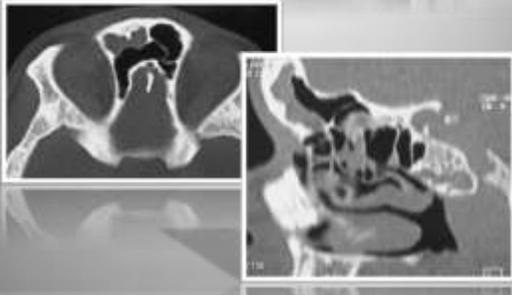
CASO 9

CASE 09:

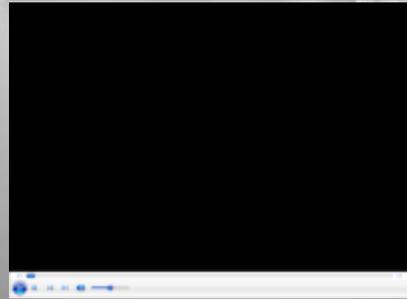
Male, 18 years old, Cerebral palsy – CRS with complications such as meningitis and orbital cellulitis.



CASO 9

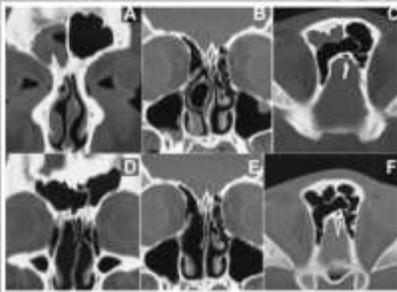


CASO 9

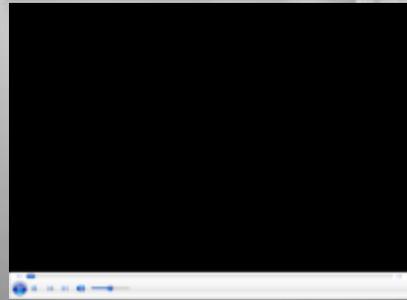


CASO 9

2 months post-operative



CASO 10



10 PACIENTES INICIAIS

| Sex | Age | Clinical complaint | Dilated sinus | Outcomes |
|-----|-----|---|-----------------------------|-----------------|
| M | 52 | Frontal headache | Frontal (revision) | Still complains |
| M | 7 | CRS | Left Maxillary | OK |
| M | 21 | Frontal headache, nasal discharge | Right Frontal | OK |
| F | 32 | Frontal headache, nasal discharge, orbital pain | Left Frontal (revision) | OK |
| F | 17 | Facial pain, nasal discharge | Right Maxillary | OK |
| F | 58 | Left facial pain, nasal discharge, headache | Stratus (Ethmoid) | OK |
| F | 30 | Facial pain, nasal discharge | Maxillary and Ethmoid | OK (Curitiba) |
| M | 25 | Frontal headache | Frontal bilateral | OK |
| M | 18 | Cerebral palsy – CRS with complications such as meningitis and orbital cellulitis | Right Frontal and Maxillary | OK |
| M | 26 | CRS - Frontal pain and nasal discharge | Frontal bilateral | OK |

NOVIDADES

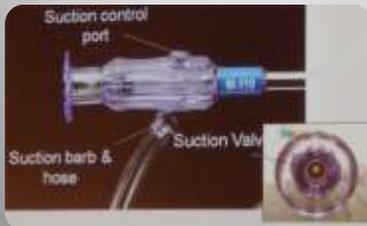


Snorkel



NOVIDADES

Snorkel



NOVIDADES

Cirurgia Endoscópica 3D Estereoscópica



CUSTOS



PACIENTE



PACIENTE

- Sinuplastia:
 - Custos
 - Equipamento
 - Índice revisional:
 - FESS: 20%
 - Sinuplastia: 9%

MARKETING

- Marketing positivo frente às empresas:
 - Volta ao trabalho mais cedo
 - Menos consultas pós-operatórias
 - Maior produtividade dos funcionários
 - Produto novo e potencial diferencial para contratos



Bibliografia e maiores
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