Allergic Fungal Rhinosinusitis *versus* Chronic Rhinosinusitis with nasal polyps: quality of life and radiological outcomes after surgery

François SIMON[1], Aurélie LECANU[1], Magali BARRAT[2], Jean-Baptiste LECANU[1]

Institut Arthur Vernes (Paris, France),
Otorhinolaryngology department[1], Radiology department[2]

LONDON RHINOLOGY 22-26 April 2018

Introduction

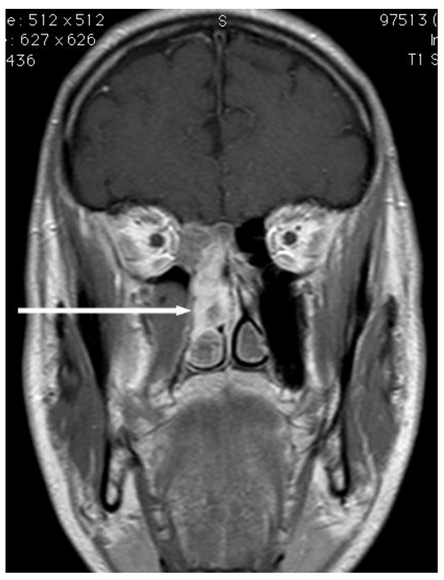
Allergic Fungal Rhinosinusitis (AFRS) is widely thought to be an eosinophilic inflammation response of the nasal mucosa to fungus (mostly aspergillus) and AFRS is currently presented as a variant of chronic rhinosinusitis with nasal polyps (CRSwNP). AFRS has a similar clinical presentation to the more common non-fungal CRSwNP but it has more severe symptoms and radiological findings, ranging from subtle to dramatic, due to bony erosion and expansion of the paranasal sinuses. AFRS treatment encompasses functional endonasal sinus surgery (FESS) and steroid therapy however its standardised management is still unclear

Aim

Compare quality of life and radiological outcomes after FESS in patients with confirmed AFRS and other CRSwNP.

Methods

. Consecutive confirmed AFRS included from 2013 to 2016
. Control CRSwNP included in 2016
. All underwent FESS, with initial assessment and prospective follow-up
. Quality of life measured with SNOT-22 questionnaire
. Radiological assessment with Lund-Mackay score



<u>Above</u>: Axial CT-scan of AFRS patient with bony erosion of the left sphenoid sinus (asterisk). Axial MRI T2-weighted image of the same patient showing bilateral nasal inflammation and sphenoidal liquid retention.

In AFRS patients' CT-scan:
67% had bony erosion and 56% tumour-like aspect

<u>Left</u>: Frontal MRI T1-weighted and gadolinium-enhanced image of a typical unilateral AFRS. Notice the heterogeneous aspect (arrow) which corresponds to typical mucin during surgery.

Results

. 23 patients included (AFRS: 9 – CRSwNP: 14): all had FESS
. All AFRS pathology: eosinophilic mucin; Charcot-Leyden crystals
. Eosinphils in 78% ; fungal hyphae in 44% ; elevated total IgE in 55%
. Post-operative oral steroids : AFRS > 1 month ; CRSwNP > 1 week
. Mean follow-up: AFRS > 23.5 months ; CRSwNP > 16 months
. After FESS: AFRS had significantly better quality of life and radiological outcome than CRSwNP
. Spearman's correlation was significant between SNOT and Lund-Mackay scores in both AFRS and CRSwNP but was stronger in AFRS: (r^2 = 68%; $p < 0.001$) vs (r^2 = 30%; $p = 0.003$)

Table 1: Patients characteristics and initial symptoms

Type of sinusitis	AFRS	CRSwNP	*p*
Number of patients	9	14	-
Age	50 ± 15	49 ± 17	*0.83*
Sex			
Male	4 (44)	6 (43)	*0.94*
Female	5 (56)	8 (57)	
Medical history			
Previous surgery	2 (22)	3 (21)	*0.96*
Asthma	5 (56)	7 (50)	*0.79*
Atopy	6 (67)	11 (79)	*0.53*
Salicylate intolerance	1 (11)	1 (7)	*0.74*
Symptoms			
Sneezing	1 (11)	5 (36)	*0.19*
Anosmia	8 (89)	14 (100)	*0.20*
Nasal obstruction	9 (100)	14 (100)	*1*
Rhinorrhea	7 (78)	13 (93)	*0.29*
Bilateral	6 (67)	14 (100)	*0.02*

Results are shown either by number (proportion) or by mean ± standard deviation. *p* was calculated using the chi-square test (proportions) and nonparametric Mann-Whitney test for mean. *AFRS* Allergic Fungal Rhino-Sinusitis *CRSwNP* Chronic Rhino-Sinusitis with Polyps (excluding AFRS).

Table 2: Quality of life and radiological outcomes after surgery

Type of sinusitis	AFRS	CRSwNP	*p*
SNOT-22			
Initial score	62.6 ± 12.3 (37;77)	52.4 ± 22.2 (17;86)	*0.30*
Follow-up score	19.1 ± 15.2 (3;53)	27.6 ± 10.9 (12;55)	*0.04*
Difference	43.4 ± 19.6 (9;66)	24.7 ± 16.9 (2;56)	*0.03*
Lund-Mackay			
Initial score	15.7 ± 5.9 (8;23)	13.6 ± 4.8 (4;20)	*0.45*
Follow-up score	3.9 ± 2.5 (1;8)	6.5 ± 2.6 (2;11)	*0.04*
Difference	11.8 ± 4.5 (7;18)	6.9 ± 3.5 (0;12)	*0.02*
Follow-up (months)	23.5 ± 14.5 (8;45)	16.0 ± 5.7 (9;26)	*0.51*

Results are shown either by mean ± standard deviation (range). Follow-up corresponds to the delay in months between surgery and follow-up scores. SNOT-22 is the Sinonasal Outcome Test-22 quality of life score (range: 0-110); Lund-Mackay is the CT radiological score (range 0-24). *p* was calculated using the nonparametric Mann-Whitney test. *AFRS* Allergic Fungal Rhino-Sinusitis *CRSwNP* Chronic Rhino-Sinusitis with Polyps (excluding AFRS).

Conclusion

This preliminary study seems to show that AFRS patients have an overall better outcome after surgery than patients with other types of CRSwNP. Significant differences were found in both quality of life (SNOT-22) and radiological (Lund-Mackay) scores. The stronger correlation between radiological scores and quality of life in these patients also tends to show that these patients could have an increased benefit of FESS, which can directly relieve them of mucin-induced nasal obstruction and inflammation. Although further studies are required to better understand this rare disease, we would tend to recommend a more systematic surgical stance as soon as AFRS is suspected in order to completely clear the nasal fossa of mucin.