Benefit: Ability to identify patients who are predisposed to developing RARS.
Harm: False identification of conditions that may not be associated with RARS.
Cost: Cost associated with immune testing, allergy testing, or sinus culture.
Benefits-Harm Assessment: Preponderance of benefit over harm.
Value Judgement: Identification of patients at risk for RARS will allow for more targeted and effective therapeutic approach.
Policy Level: Recommendation.
Intervention: Consider immunologic testing, allergic testing, and bacterial culture in patients with concern for RARS.

VIII.C.2 | Contributing Factors for RARS: Anatomic Factors

The literature that evaluates the impact of anatomic variants in RS patients is comprised of radiographic studies that evaluate CT scans in these patients. There are 3 studies published examining the presence of anatomic variants in RARS patients suggesting that anatomy may play a role. One was a case-controlled study comparing sinonasal anatomic variants between RARS and control patients who had undergone imaging unrelated to sinonasal pathology (ie, pituitary and ear imaging) (Table VII-4). This study examined 36 adult RARS patients compared to 42 control patients without RS.[341] There was statistically higher number of infraorbital (Haller) cells and a smaller infundibular diameter in the RARS group compared to the control group. There was a trend toward association with NSD and concha bullosa in the RARS group, however the study numbers were small and may have been insufficient powered. This data suggests that anatomic changes of the osteomeatal complex may predispose one to RARS with important implications to surgical targets.

Another study investigating the role of anatomy in RARS was a single-institution case series investigating sites of inflammation within a given scan and correlation of this anatomy with clinical course.[207] This study examined the incidence and importance of anatomic variants, such as frontal cells, infraorbital ethmoid cells, concha bullosa cells, or septal deviations in patients with RARS. They examined 26 patients and found that type 2 frontal cells correlated with a greater number of years with RARS ($p = 0.0363$). The study did not find a higher incidence of anatomic variants in the RARS group compared to prior published literature reporting anatomic variants and did not find an association between Lund-Mackay score and anatomic variants. Further study investigating anatomic associations with RARS along with the clinical associations will help better clarify the etiology and further intervention of this disease.

The final study investigating anatomy was a single-institutional case series of 160 patients with a history of RARS with categorization of anatomic variants that might impact the ostiomeatal complex.[503] More specifically, this study was examining patterns of concha bullosa, paradoxical middle turbinates and septal deviation as potential factors impacting the ostiomeatal complex. The study is unfortunately undermined by ambiguous objective inclusion criteria (patients with evidence of ARS on scan were excluded) and a lack of a control group limiting the ability to draw conclusions beyond that the concha bullosa size and degree of septal deviation correlate.

VIII.D | Management of RARS

VIII.D.1 | RARS Management: Intranasal Corticosteroids (INCS)

A total of 3 double-blinded RCTs (DBRCTs) were identified assessing the effect of INCS on symptom outcomes of RARS patients (Table VIII-6). All studies reported improvement in symptoms in the treatment groups and no serious adverse effects of INCS. A systematic review by van Loon et al. summarized the impact of INCS on symptom relief in RARS patients based on these 3 DBRCTs, citing overall limited evidence.[431] Dolor et al. (n = 95) demonstrated significant difference in median days to clinical success (6 in treatment group vs 9 in placebo group; $p = 0.01$) with fluticasone.[421] Meltzer et al. (n = 407) demonstrated improvement of total symptom scores and specific symptoms of headache, congestion, and facial pain with mometasone.[435] Qvarnberg et al. (n = 40) demonstrated improvement in facial pain and sensitivity with budesonide.[504]

One major limitation is that none of the studies defined RARS according to the AAO-HNS definition of 4 or more episodes yearly with absence of intervening symptoms, thereby limiting applicability to RARS patients. Another limitation was inclusion of additional therapeutic agents in addition to INCS. All studies included antibiotic co-treatment, and one also included nasal decongestant therapy. Therefore, the benefits of INCS as monotherapy and its potential in reducing antibiotic prescription are unclear. Another limitation is the variability of types and doses of INCS and duration of therapy. Finally, INCS were used in these studies during periods of acute exacerbation, and thus efficacy as a preventative therapeutic measure is unknown. Dolor et al. showed fewer patients experienced