

# Preoperative microbiology screening and its prediction of surgical outcomes in cleft lip and palate surgery.

Andrew Gardner<sup>a</sup>, Craig Russell<sup>a</sup>, Arup Ray<sup>a</sup>, David Wynne<sup>a</sup>, David Young<sup>b</sup>, Mark Devlin<sup>a</sup>

on behalf of The West of Scotland Cleft Service, The Royal Hospital for Sick Children, Yorkhill, Glasgow, United Kingdom

<sup>a</sup> NHS Greater Glasgow and Clyde <sup>b</sup> University of Strathclyde

## Introduction

The management of oro-nasal micro-flora in cleft children in the peri-operative period remains an area of ongoing discussion amongst cleft clinicians/researchers. Many questions remain unanswered including: When is the optimal time to swab patients pre-operatively? Does treating positive pre-operative growths prevent operative complications? Should empiric antibiotics be used pre-operatively? And is there any evidence for a relationship between the micro-flora present at the time of surgery and surgical outcome? Definitive data on this last question are lacking<sup>1,2</sup>.

## Aims

This study sought to describe the microbiology of the oro-nasal cavity in a cohort of cleft patients in the West of Scotland and assess relationships between specific oro-nasal micro-flora and clinical outcomes following cleft surgery.

## Method

This retrospective study was undertaken on data from a historical two year cohort of patients treated at the Royal Hospital for Sick Children, Yorkhill, Glasgow.

All patients in this two year period had oro-pharyngeal and nasal swabs collected routinely on admission in the 24 hours preceding their elective surgery.

All swabs were processed according to the standardised local protocols utilised in the local microbiology laboratory. Results were recorded as documented according to the standardised culture reports. Findings of normal oral flora and/or specific pathogen/pathogens along with patient demographics, cleft diagnosis and operative intervention were entered on a dedicated spreadsheet (Microsoft excel ®) for analysis.

No culture results were available prior to surgery. Empiric antibiotics of the operating surgeon's choice were given on induction of anaesthesia.

Each patient was assessed at a post surgery review clinic and the surgical outcome was noted. (Healed Satisfactorily / Wound Dehiscence / Fistula Present / No Record of Outcome)

Two hundred and sixteen elective cases were identified from the theatre logs / consultant operative diaries for the period in question. Patients were excluded from analysis if either pre-operative swab results or post operative review findings were missing. 188 treatment episodes were available for investigation.

Data were analysed using Minitab 15® statistical software with p-values of < 0.05 being considered significant. Data were categorical, as such chi-squared analyses or Fischer's exact tests (when expected values were too small) were employed.

## Results

Sixty four percent (142) of the surgical procedures carried out during this time period were primary repairs, 11% (24) secondary repairs and 25% (55) other cleft lip and palate procedures.

Fig 1

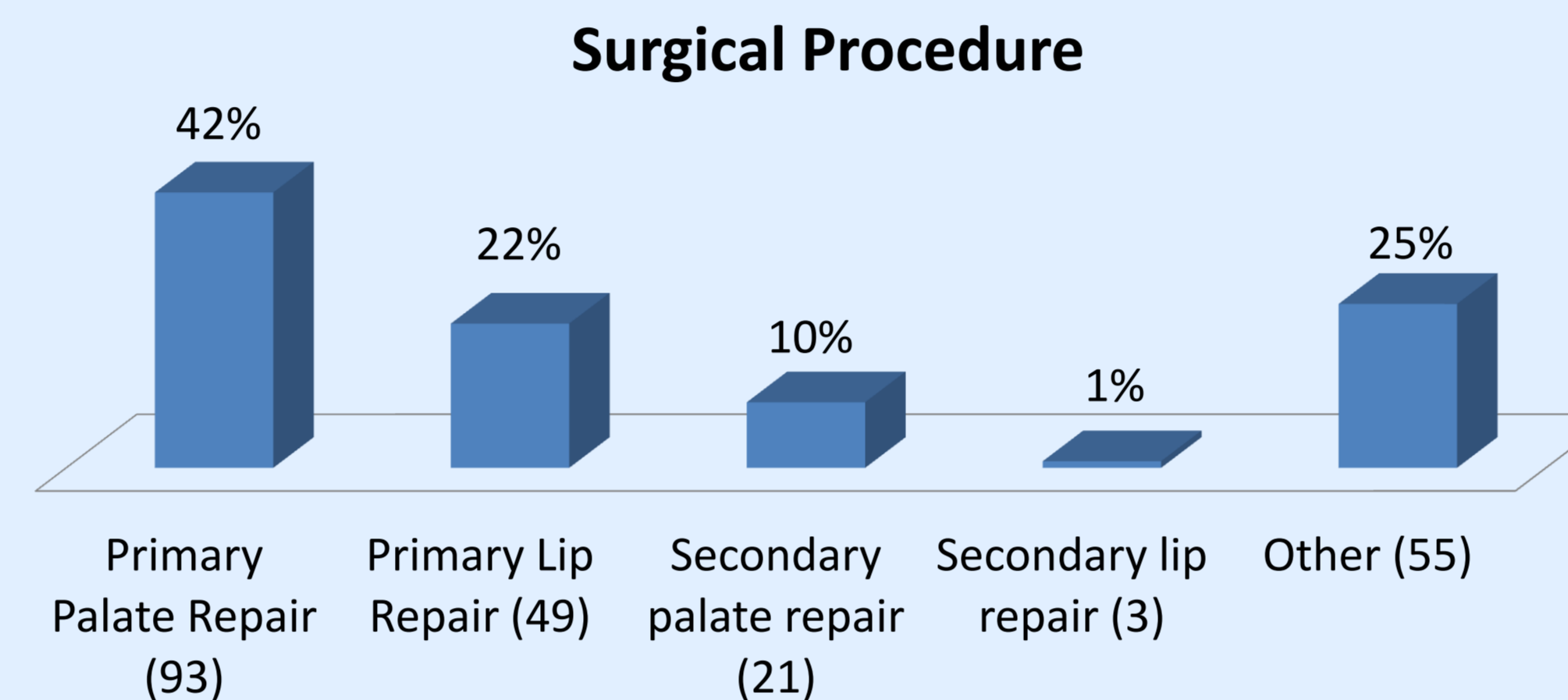
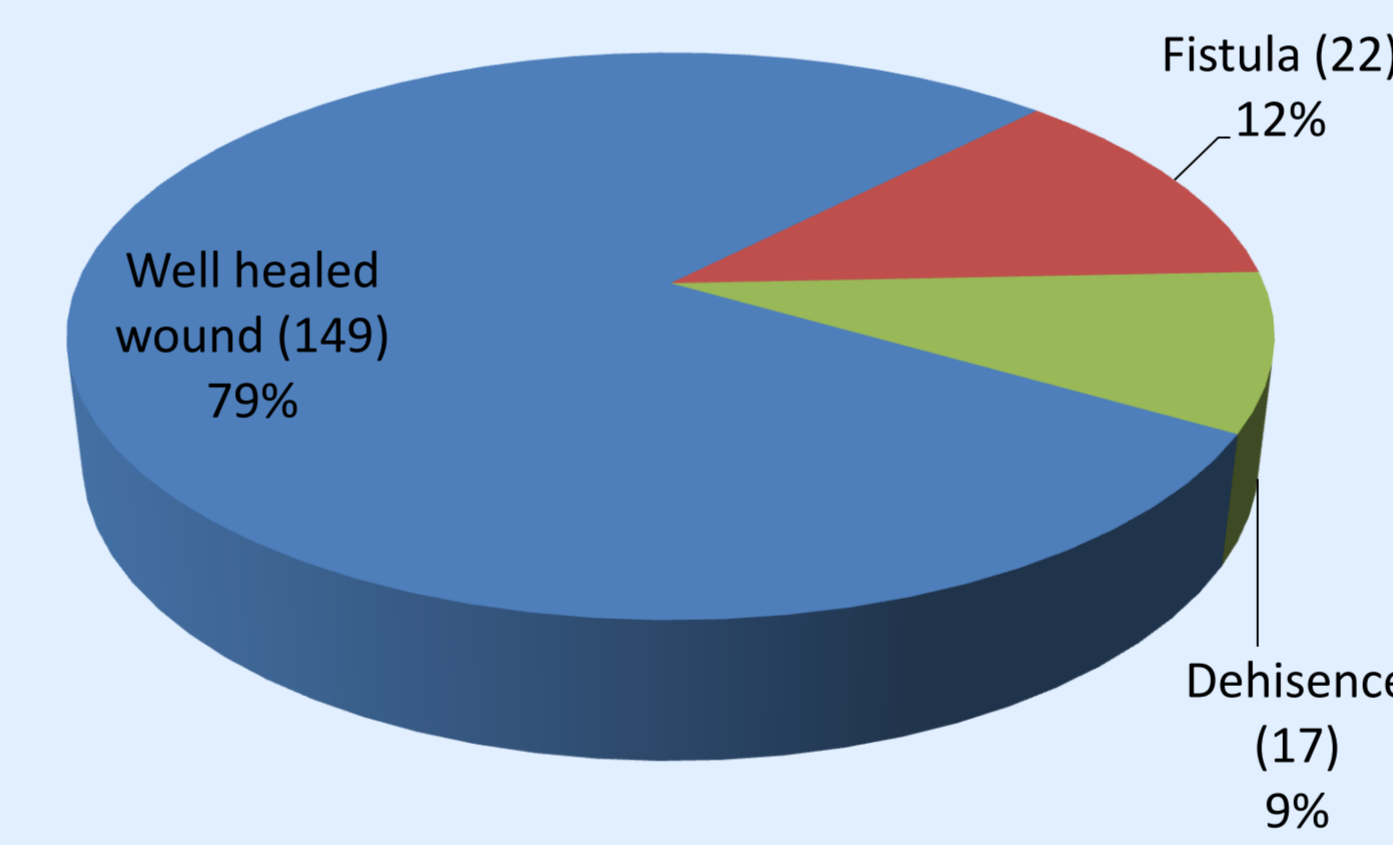


Fig 2

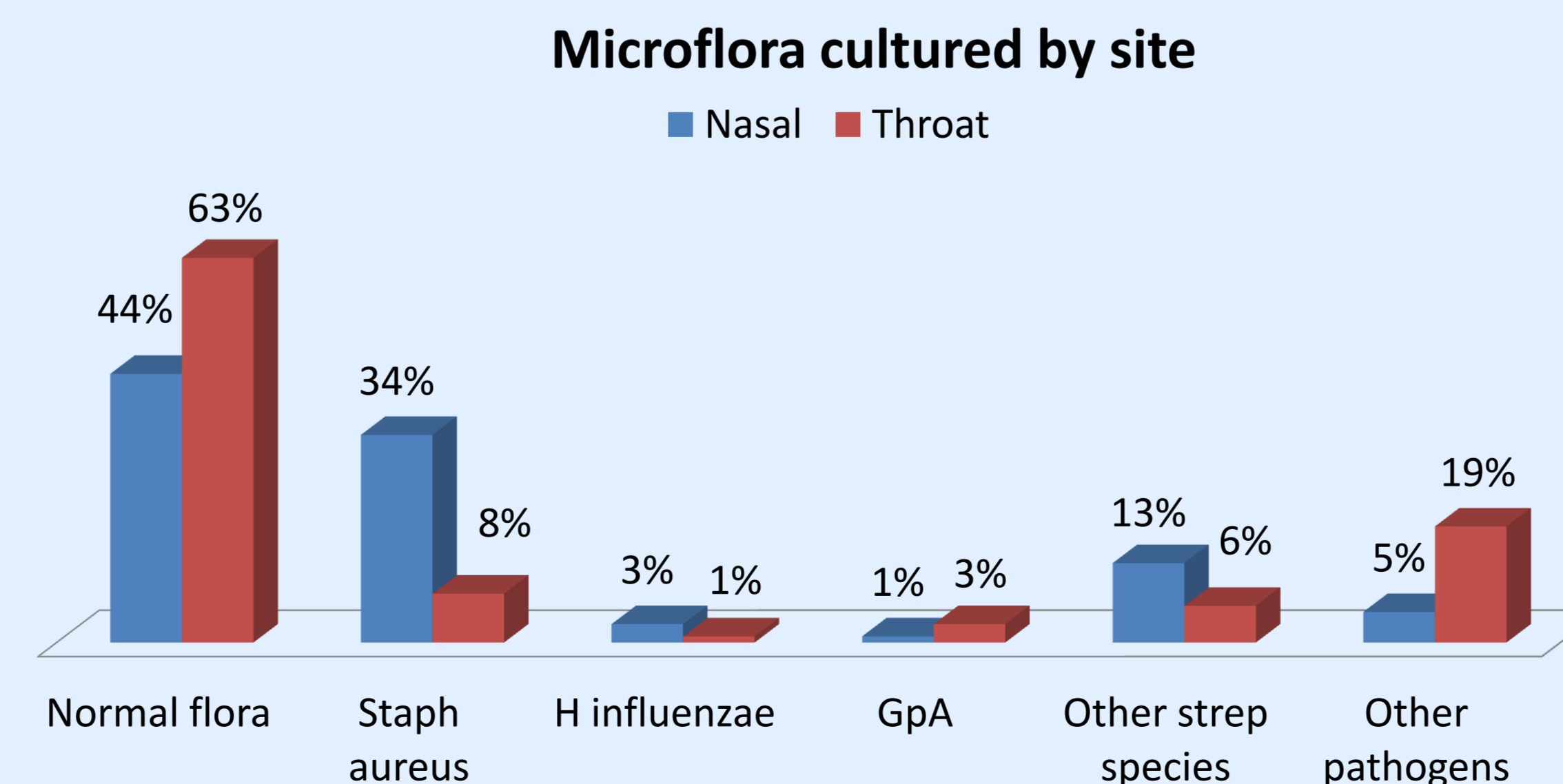
Thirty nine cases (21%) had a poor outcome, recorded in the patients notes as a dehiscence or fistula.



Normal oral flora (56%) was the commonest microflora cultured from the population with staphylococcus aureus (20%) the commonest pathogen.

When assessed by site, nasal swabs grew significantly more pathogens than the throat swabs (p-value 0.007).

Fig 3



Haemophilus influenzae (opposite) cultured from the nasal cavity was statistically significantly linked with poor surgical outcome (p-value 0.042). No other cultured pathogen from throat or nasal swabs were statistically significant.

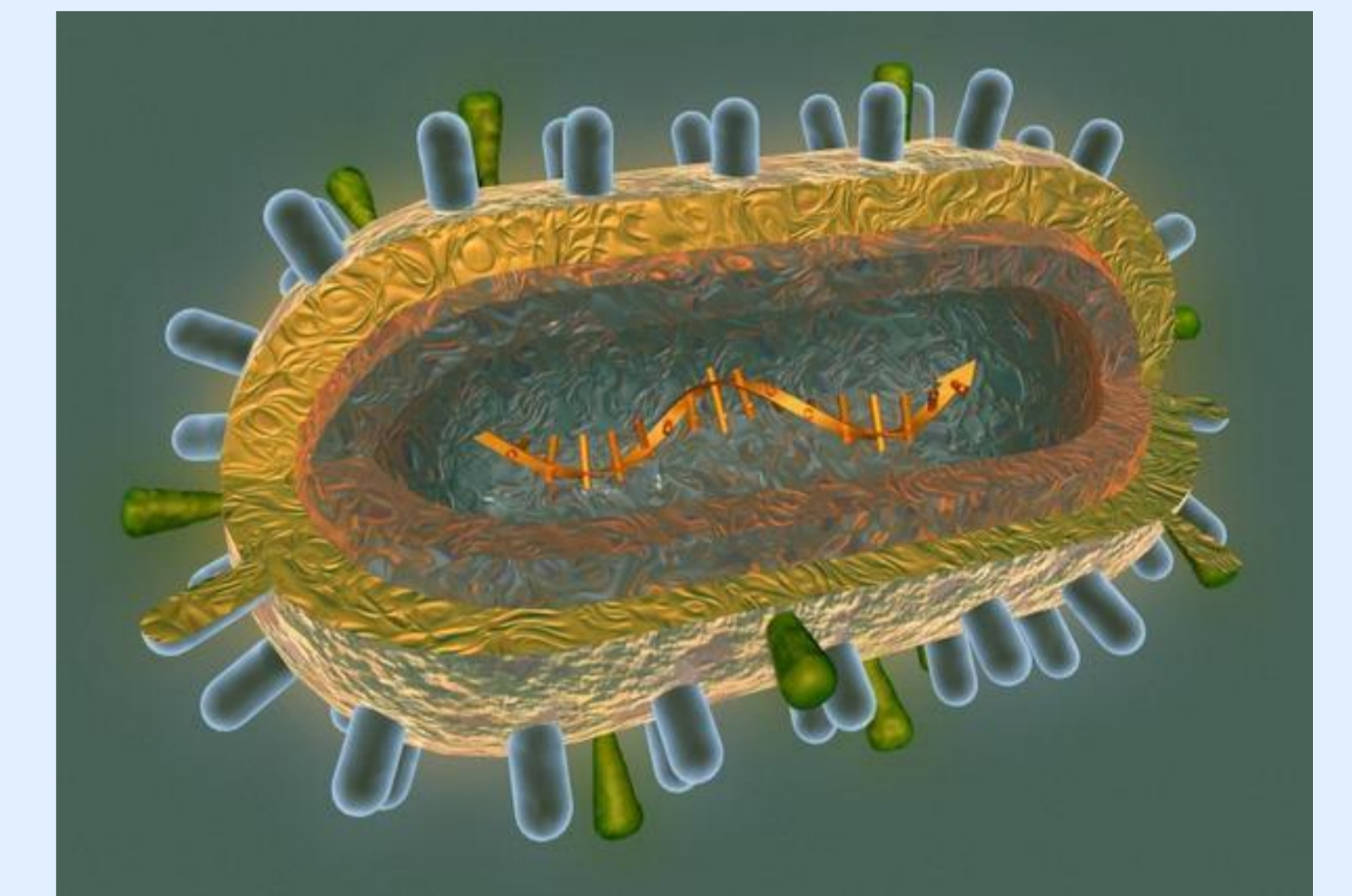
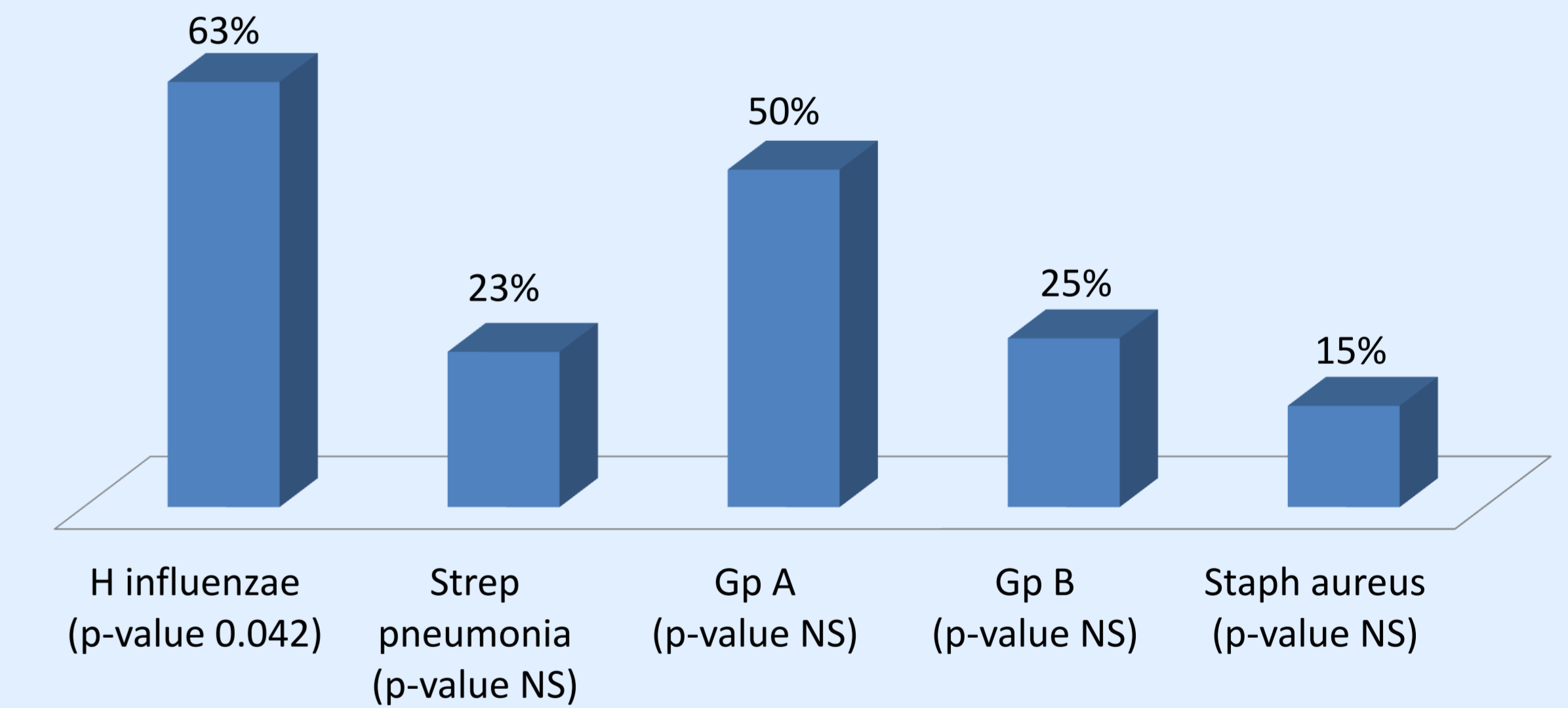


Fig 4

## Percentage of nasal pathogens isolated that resulted in a poor outcome



Neither age nor sex of the patient was statistically significant when looking at surgical outcomes.

## Conclusion

This retrospective study demonstrates a significant association between peri-operative colonisation of the nasal cavity with poor surgical outcome from cleft surgery (wound dehiscence or fistula formation). While the finding of an association of specific pathogen with deleterious outcome is at odds with recent studies (Tomas et al) we do confirm the finding of significantly greater frequency of positive pathogen growths from nasal swabs (Fig 3).

While not definitive this study does highlight the need to consider aggressively treating H. Influenzae colonization in cleft patients in an attempt to prevent adverse wound outcomes. If H. Influenzae is isolated from swabs taken that allow pre-operative treatment these data would support delaying surgery until the pathogen is eradicated.