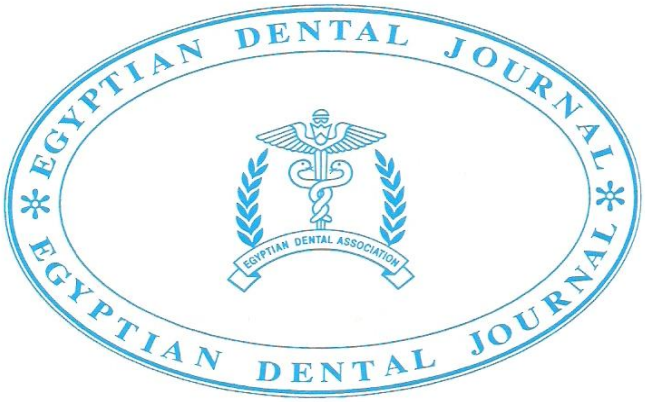

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FIRST 4-YEARS ORTHOGNATHIC SURGERY AUDIT OF A SAUDI TEACHING HOSPITAL

Khalid Abdel-Wahab Ahmed*

ABSTRACT

The study represents a retrospective audit of the first four years of orthognathic surgery carried out at a Saudi teaching hospital. The results showed that orthognathic surgery was the most common oral and maxillofacial surgery performed in that particular hospital, which is one of two teaching hospitals covered by the division of oral and maxillofacial surgery, faculty of dentistry, King Saud University in Riyadh, Kingdom of Saudi Arabia. The variation in the patients characteristics, treatment provided, and final outcome is presented.

INTRODUCTION

The assessment of treatment outcome has for long been one of the great responsibilities of the medical profession. In the last two decades, or so, this process of assessing the medical care offered was given the name "Medical Audit" or "Quality Assurance". The most accepted definition of the term "Medical Audit" was the one phrased by the Department of Health in United Kingdom in the year 1989.[1] This was defined as "The systematic critical analysis of the quality of care provided, including procedures used for diagnosis and treatment, the use of resources and the result in outcome and quality of life of the patient".

In the United States, Canada, and Netherlands[2-4] the term "Quality Assurance" is more in use and the process was introduced by different medical bodies, and lastly implemented nation-wide by governmental rules in the last two decades. In the United Kingdom the development of national medical audit had a slower progress until the year 1989, when it appeared in the Department of Health working paper number 6 attached to the white paper on National Health Service.[5] The reforms of the white

* Lecturer Oral and Maxillofacial Surgery Faculty of Dentistry King Saud University P O Box 60169 Riyadh 11545Kingdom of Saudi Arabia

paper states that medical and surgical audit can only be done by the professionals in each specialty who are in a position to make proper assessment of the medical performance. The British National Health Service (N.H.S.) regulations forced all the medical and dental institutes to develop their own medical audit programmes at or before the end of the year 1990.

On the contrary, in many middle east countries the term "Medical Audit" is almost an unknown medical term, specially in the field of dentistry.

In the Kingdom of Saudi Arabia some medical audit programmes were developed,[6] but, to the best of our knowledge, none was performed in the dental field.

The division of Oral and Maxillofacial Surgery, Faculty of Dentistry, King Saud University, Riyadh, Saudi Arabia, we believe has many unique characteristics. These characteristics include that the staff of this division teach and supervise undergraduate and postgraduate students and interns in physically two dental colleges namely the males and the females which are the two sections of the dental college. Operations under local anesthesia are performed in the dental college. In addition operations under general anesthesia and on-call coverage for the accident and emergencies are carried out in two university hospitals namely, King Khalid and King Abdelaziz University Hospitals. On the other hand the staff of the division teach and conduct ward rounds in the Ministry of Health, Central Hospital in Riyadh. For all these unique features it was decided to run a comprehensive surgical audit for the performance of the division of Oral and Maxillofacial Surgery in all the areas of its operation.

The scope of this study will cover only the cases of orthognathic surgery performed only at King Khalid University Hospital during the period between 1/1/1410 and 1/1/1414.

MATERIALS AND METHODS:

A retrospective process surgical audit of all the orthognathic surgery cases performed at King Khalid University Hospital during the period between 1/1/1410 and 1/1/1414 will be carried out. The data was collected using audit proforma from both the patients' medical records and the operation room's records.

Data was stored and analyzed using the Q&A version 3.0 software computer programme.

RESULTS:

The analysis of the whole oral and maxillofacial surgical load at King Khalid University Hospital, showed that orthognathic surgery was the most common surgery performed during the study period (Fig. 1). Orthognathic surgery was followed by slightly lesser percentages of trauma and transalveolar surgery. This higher frequency of orthognathic surgery led us to investigate this category of surgical cases in more depth.

The eligibility for elective treatments at the university hospitals was either for Saudi patients or university employees and their families. Analysis of the variation in nationality of the treated patients showed that 83.9% of the patients who received orthognathic surgery were Saudi (Fig. 2).

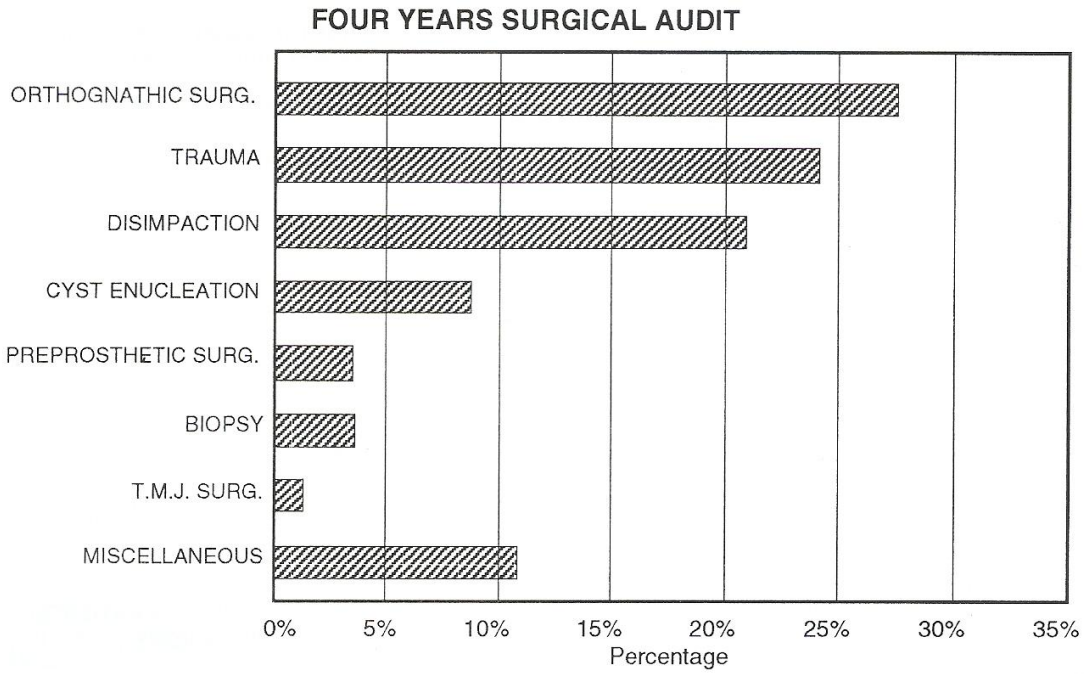

Fig. 1: Histogram showing the different types of surgeries performed over four years

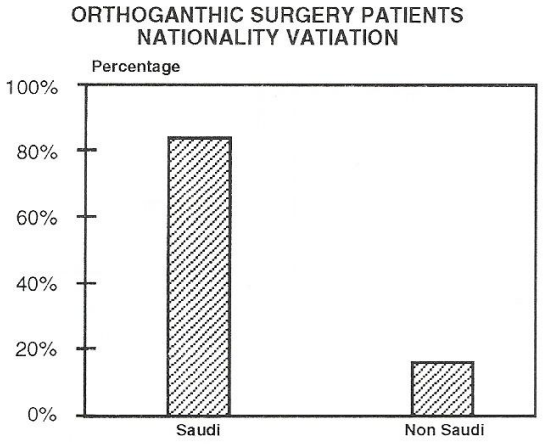

Fig. 2: Histogram showing nationality variation

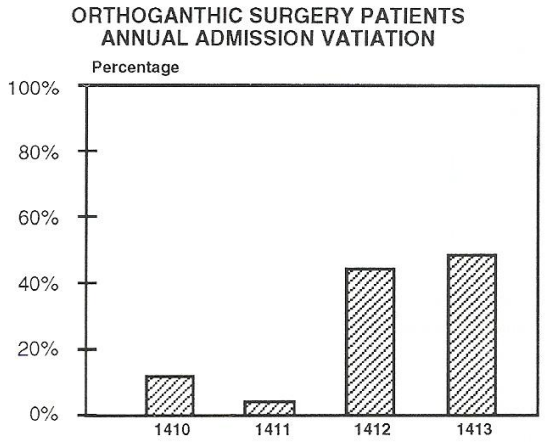

Fig. 3: Histogram showing annual admission rate

The study of the variation in the annual admission of orthognathic surgery cases, showed a striking increase in the number of patients from 2 and 1 patients in the years 1410 and 1411, to 14 and 15 patients during the years 1412 and 1413 respectively (Fig. 3).

More male patients (58.1%) underwent orthognathic surgery as compared to female patients (Fig. 4). The average age of both sexes was almost the same of about 21 years (Fig. 5). All the female patients had their orthognathic surgery at or before the age of thirty years,

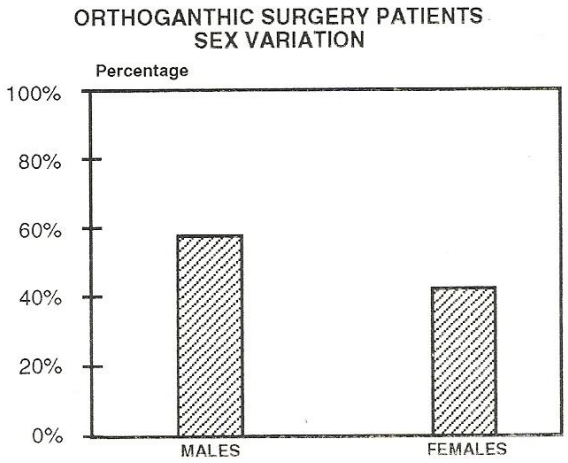

Fig. 4: Histogram showing sex variation

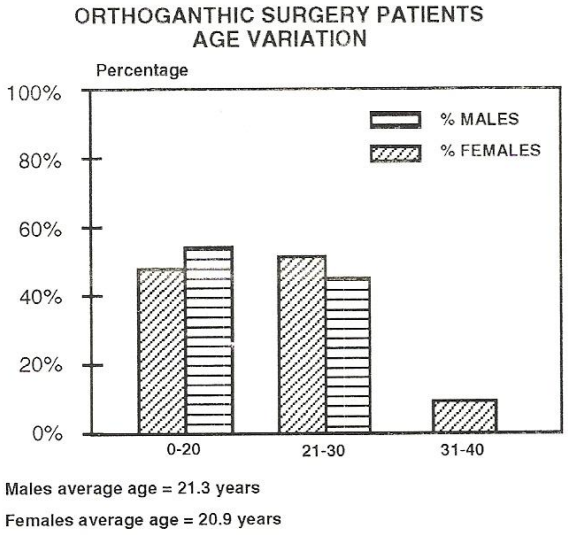

Fig. 5: Histogram showing age distribution

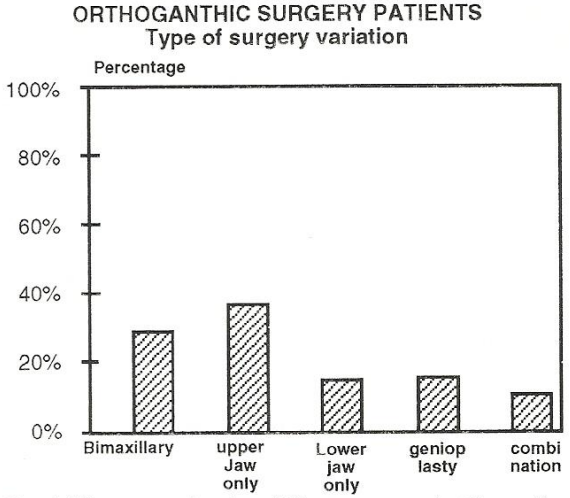

Fig. 6: Histogram showing different types of orthognathic surgeries performed

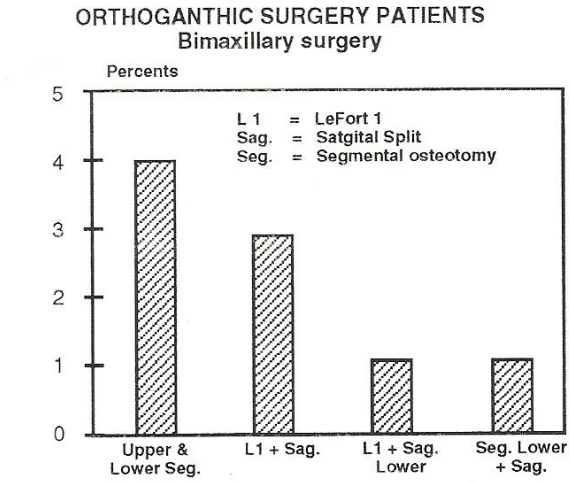

Fig. 7: Histogram showing different bimaxillary operations

while one male patient was operated at an age over thirty years (Fig. 5).

Upper jaw orthognathic surgery was the most common type of orthognathic surgery performed (33.3%). This was followed by bimaxillary procedures as the second most common surgery, and equal percentages of genioplasty and lower jaw surgery (Fig. 6). On considering the bimaxillary osteotomy cases, it was found that upper and lower segmental surgery was the most common operation (4 patients) followed by LeFort 1 and mandibular sagittal split surgery in three patients (Fig. 7). The most common upper jaw surgery was found to be LeFort 1 operation (Fig. 8). On the other hand 80% of the mandibular orthognathic surgery was performed via sagittal split technique (Fig. 9).

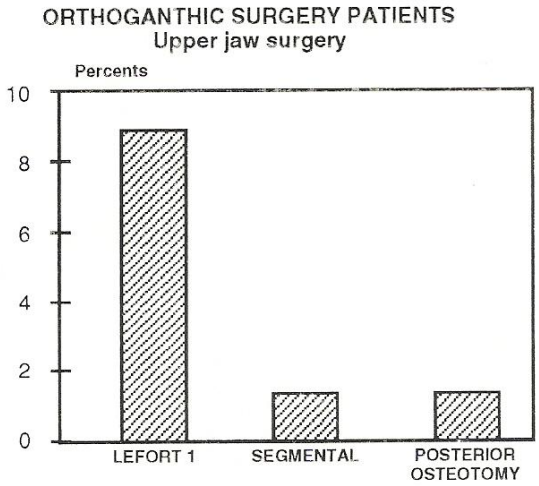

Fig. 8 : Histogram showing different upper jaw surgeries

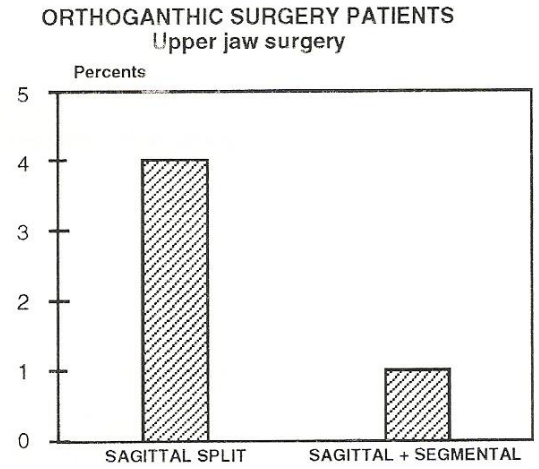

Fig. 9 : Histogram showing different lower jaw surgeries

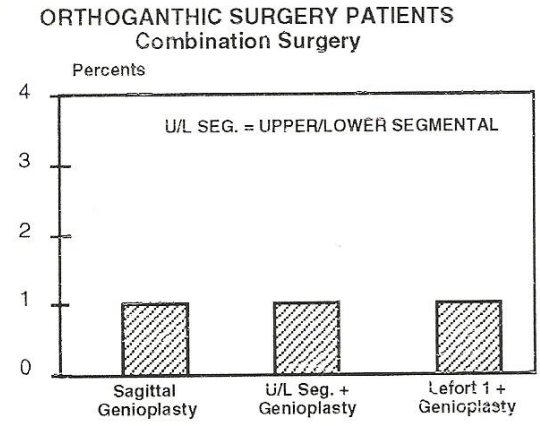

Fig. 10 : Histogram showing combination surgeries performed

Three patients had combination therapy which included either one jaw or two jaws surgery in addition to genioplasty (Fig. 10). Internal rigid fixation using the AO miniplate fixation system was used for five cases (15.2%) only, leaving the transosseous wiring in addition to maxillomandibular fixation to be the most common fixation technique used (Fig.11).

Bone grafts were inserted in two cases (6.1%) of LeFort 1 osteotomy and blood transfusion was required for 19 surgeries (57.6%) with an average of two units of blood transfused in each of these cases (Fig. 12). Complications reported included in addition to the common postoperative complications, removal of bone plates in one case and second corrective surgery was required in two patients (6.4%) for readjustment of occlusion (Fig. 13).

The surgeon's rank was also studied, which revealed that almost all the cases were performed by consultants except one case of

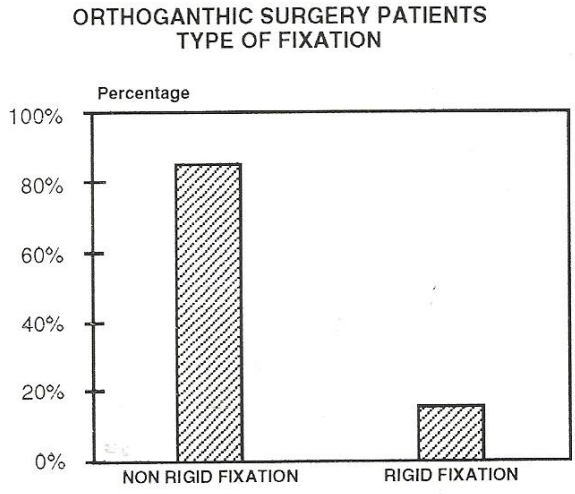

Fig. 11 : Histogram showing different fixation techniques applied

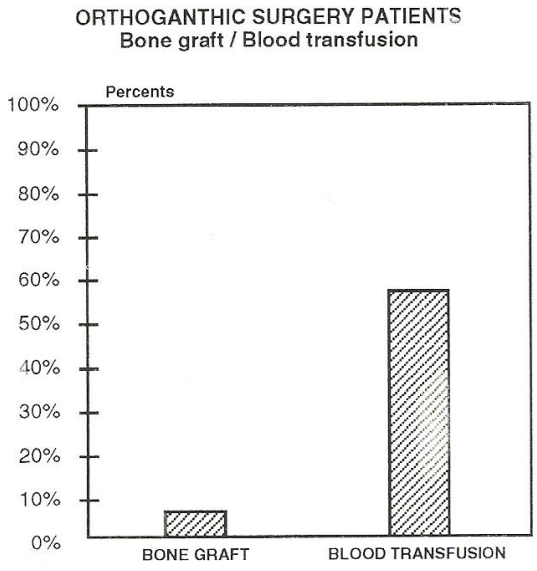

Fig. 12 : Histogram showing frequency of blood transfusion and bone grafting

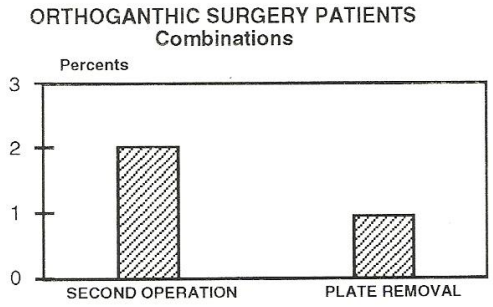

Fig. 13: Histogram showing major complications encountered

upper and lower segmental surgery which was operated by a lecturer/registrar (Fig. 14). In addition, as expected, the highest percentage of cases (36.4%) were operated by the most senior consultant (Fig. 14).

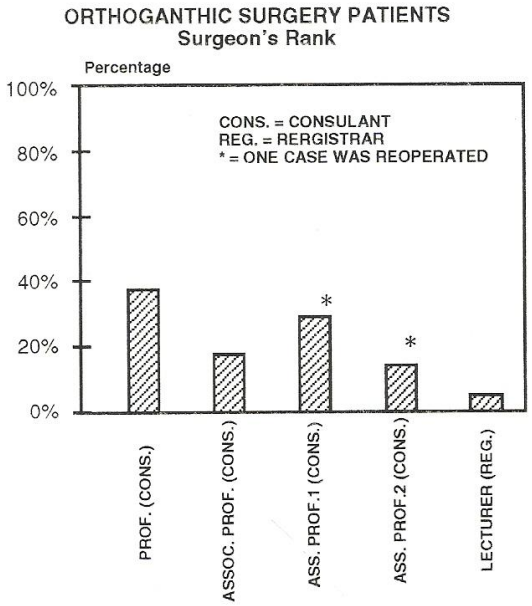

Fig. 14: Histogram showing variations in the surgeon's rank

DISCUSSION:

Orthognathic surgery is relatively a new field of maxillofacial surgery which started to get a great deal of popularity on an international basis, and the middle east and gulf countries are not an exception to this fact. In Saudi Arabia, until few years back all the patients with marked skeletal discrepancies had no chance for a better look except with a compromise orthodontic treatment. This was documented with the very few number of orthognathic cases operated in the first two years of this study. In addition the operations performed in those first years were the simplest types of orthognathic surgery. With the increase in number of cases in the consecutive years surgical experience and confidence in the predictability of the resultant outcome of this type of surgery, all these factors together

put orthognathic surgery in its deserved place as the most common elective surgery performed in the division of Oral and Maxillofacial Surgery, Faculty of Dentistry, King Saud University. An additional advantage of the increased confidence in orthognathic surgery was the shift to the use of modern fixation techniques namely internal rigid fixation, where all the five cases treated by this technique were performed only in the last year of the study. On the other hand one of most important check point of any audit study is to ensure that the medical service in question is offered to the patients eligible for it. The result of the study strongly confirmed that over eighty percent of the cases treated was Saudi citizens for whom elective surgery should be priority.

The number of surgeries performed (33) although it may be considered not too many ,statistically, but considering the fact that only one male and one female bed is allocated to the division, with only one operating day once a week for elective cases, all this put together result to an average of slightly less than one orthognathic surgery case performed every academic month throughout the study period. This figure, to the best of our knowledge closely resembles the number of cases performed in other highly specialized centers with more available beds and operating time. In addition the number of cases operated will also depend on the demand and the desire of patients to seek treatment, therefore we believe that the increase of public awareness of orthognathic surgery will greatly increase the number of the orthognathic surgery cases in our division.

Unexpectedly, from the social point of view, more males underwent orthognathic surgery as compared to female patients. Nevertheless the age factor between the two groups was almost the same except that more females had their surgery slightly below twenty years.

Single jaw surgery was found to be the most common type of orthognathic surgery performed specially in the first year of the study, while almost all the bimaxillary cases were performed in the last two years. In our opinion the introduction of such a new type of surgery to the performance of division should be with great caution and until enough experience is built up.

Studying the variation in the type of fixation revealed that vast majority of cases had wire osteosynthesis, non-rigid type of fixation with or without circumzygomatic suspension in maxillary osteotomies. Only five cases had rigid internal fixation using bone plates and screws. This was primarily a result of unavailability of the suitable hardware until now. The rigid fixation system used was the AO system using the miniplate orthopedic set, and all the cases treated were performed during the last year of the study.

Bone grafts were found necessary only in two cases, while blood transfusion was found necessary in almost all the cases of Lefort 1 osteotomy either alone or together with lower jaw surgery. Complications ranged from transient minor common surgical complications such as swelling, pain, and transient paresthesia up to failure to achieve the desired

occlusion in two cases with one of them requiring removal of the bone plates and screws. No case was reported to have infection or mortality. The analysis of the surgeon's rank showed as expected that the highest number of cases were treated by the most senior surgeon namely by the only professor in the division.

CONCLUSIONS:

The current surgical audit aims to study the performance of a maxillofacial surgery unit at one teaching hospital. The long term outcome of the provided treatment is beyond the scope of the study. The main message gained from the study is to expose the great importance of running such type of analysis specially in new surgical practices. We urge all the surgeons in the region to believe in the benefits of medical audit which are stated by the Royal College of Physicians of England (1989)[7] as " It is a matter of faith that it benefits clinical practices, based on the belief that thoughtful and constructive criticism and analysis are self evidently educational and likely to improve care"

ACKNOWLEDGMENT:

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