

Accidental ingestion and aspiration of root canal instruments and other dental items in a French population

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INTRODUCTION: There is no doubt among endodontists that using a rubber dam for root canal treatment is mandatory. Postgraduate endodontic students are taught the importance of a rubber dam and how to place it under even the most difficult clinical conditions, even on crownless or cone-shaped teeth. However, in spite of the serious consequences of ingestion and aspiration, most surveys showed that most of the general practitioners do not use rubber dams when performing routine endodontic treatment, regardless of the country. Our own experience showed that patients swallowed or inhaled not only endodontic instruments but also other items such as crowns, burs, and copper band.

There are published case reports describing swallowing and aspiration of dental items but no study gives the prevalence of this type of accident.

METHODS: The data were provided by two insurance companies representing 24,651 French general dentists over 11 years.

For aspiration and ingestion, the following data were recorded:

- 1) The endodontic instrument or dental item involved and the percentage of occurrence of either aspiration or ingestion. The prevalence of accidental aspiration or ingestion was calculated.
- 2) The need for hospitalization. A chi2 test was performed to compare aspiration and ingestion. Two other chi2 tests, for ingestion and aspiration, were performed to compare endodontic versus non-endodontic items in order to know whether endodontic instruments are more dangerous and required hospitalization more frequently. The significance level was set at 5%.

RESULTS :

Table 1. *Number of endodontic instruments or dental items involved and the percentage of occurrence of either aspiration or ingestion.*

	Aspiration	Ingestion
Endodontic file	1	57
Barbed broach		27
Bur		125
Temporary crown	5	15
Prosthesis	27	136
Matrix band		14
Piece of amalgam	2	17
Screw post	3	9
Extracted tooth		7
Orthodontic bracket		8
Inlay core	7	49
TOTAL	44	464

Table 2. *Number of cases requiring hospitalisation.*

	Aspiration of non endo item	Aspiration endo tool	Ingestion non-endo item	Ingestion endo tool
Without hospital	0	0	237	61
With hospital without intervention	0	0	94	21
With hospital and intervention	43	1	37	14
TOTAL		44		464

CONCLUSIONS:

The percentage of endodontic instruments aspirated or ingested were 2.2% and 18% respectively.

For the endodontic instruments, the prevalence for aspiration was 0.0009 per 100,000 root canal treatments and the prevalence for ingestion was 0.08 per 100,000 root canal treatments.

The Chi2 test showed a statistically significant difference between aspiration and ingestion ($p < 0.0001$). All aspiration cases (100%) required hospitalisation compared to 36% for ingestion. No statistically significant difference was found between ingestion and aspiration of endodontic instruments compared to non-endodontic items.