ASSESSMENT OF REASONS FOR INITIAL ENDODONTIC THERAPY
FAILURE BASED ON RADIOGRAPHIC FINDINGS

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ABSTRACT
Objective: To assess the reasons for failure of beginning endodontic therapy.

Material and Method: This descriptive cross-sectional study was carried out at University of Lahore during the period from February, 2016 to December, 2016. Total 400 patients were included in which males were 214 (53.50%) and female patients were 186 (46.50%). Age ranges of all the patients were 13-years to 70-years. To find out the reasons for failure of beginning root-canal therapy, examination of periapical radiographs of these four hundred patients was done.

Results: Canal under-obturation was found in 182 (45.50%), poor-obturation in 104 (26.0%), missed canals had 58 (14.50%), over-obturation observed in 20 (5.0%) and iatrogenic error was found in 9% as a reason for failure of beginning root-canal therapy out of these 400 radiographs.

Conclusion: It was concluded that root-canal under-obturation was the most general reason for beginning endodontic treatment failure subsequently poor-obturation, over-obturation, missed canals and iatrogenic errors.

Keywords: Radiographic Findings, Obturation, Failure, Root-Canal Treatment, Iatrogenic Error,
counteract bacterial recontamination the system of root-
canal or break the tooth.\textsuperscript{7}

Failure happen after starting endodontic treatment
when one stays unfit to satisfy the typical norms
required for the effective results. Numerous clinical
investigations have demonstrated that filling of root-
canal with poor buildup, between filling material
presence of voids and off base apical cutoff results in
endodontic treatment failure.\textsuperscript{8,9}

MATERIAL AND METHODS
Present descriptive cross-sectional study was conducted
on patients, who visit operative outpatient department of
University of Lahore during the period from February,
2016 to December, 2016. There were 400 patients
in present study who fulfill the inclusion criteria. Patients
with mobile teeth, with any root fracture, any type of
systemic disorder, non-restorable teeth were excluded.
Non probability purposive sampling technique was used
in this study. Before study obtained consent from all
patients. Patient’s demographic information i.e. address,
gender, age and name was also obtained. During study,
a detailed history obtained followed by clinical
investigation of patients. Two periapical radiographs,
one with straight angle and the other one with either
mesial shift, were taken in each patient or distal shift,
for maxillary molars, by using paralleling method with
inclusion of 2-3MM periapical area. A standard X-Ray
illuminator with magnifying glass was used to examine
all radiographs. All radiographs were investigated by
the primary author and where fundamental, counsels
were made with second and third examiners.

Root-canal obturation which was discovered in
excess of 2-MM shorter from radiographic apex
considered under-obturation. The obturation which was
reaching out past, the radiographic apex was thought
about over-obturation. Non homogenous filling or
inside spaces of root filling was contemplated as poor-
obturation. Through furcation expulsion of filling of
multi rooted teeth was considered as furcal aperture and
filling material expulsion in horizontal mass of any root
was considered strip aperture. In a root-canal detection
of broken instrument was considered as an instrument
partition. The information with respect to endodontic
treatment failure for every patient was noted on
uniquely planned/designed proforma for examination.
In this study all the cases were than endodontically re-
treated by the specialists. The analysis of obtained
information was done through SPSS Version-20.

RESULTS
There were 214 (53.50\%) males and 186 (46.50\%) were
females (Table 1). Thirty four years with standard
deviation ±12-years was the mean age of the patients.
Root-canal under-obturation was the general cause of
failure of root-canal, secondly poor-obturation and after
that missed canals and the causes for failure of root
canal along with their percentage and frequency is
shown in Table 2.

Table 1: Frequency of gender in cases of failure initial endodontic (n=400)

<table>
<thead>
<tr>
<th>Gender</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>214</td>
<td>53.50</td>
</tr>
<tr>
<td>Female</td>
<td>186</td>
<td>46.50</td>
</tr>
</tbody>
</table>

Table 2: Frequency of failure causes of Initial Endodontic

<table>
<thead>
<tr>
<th>Root Canal Failure Reason</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under-obturation</td>
<td>182</td>
<td>45.50</td>
</tr>
<tr>
<td>Over-obturation</td>
<td>20</td>
<td>5.0</td>
</tr>
<tr>
<td>Missed-canals</td>
<td>58</td>
<td>14.50</td>
</tr>
<tr>
<td>Poor-obturation</td>
<td>104</td>
<td>26.0</td>
</tr>
<tr>
<td>Strip-perforation</td>
<td>6</td>
<td>1.50</td>
</tr>
<tr>
<td>Furcal-perforation</td>
<td>2</td>
<td>0.50</td>
</tr>
<tr>
<td>Ledge-formation</td>
<td>10</td>
<td>2.50</td>
</tr>
<tr>
<td>Separated instrument</td>
<td>16</td>
<td>4.0</td>
</tr>
<tr>
<td>Coronal-leakage</td>
<td>2</td>
<td>0.50</td>
</tr>
</tbody>
</table>

DISCUSSION
Microorganism eliminate from tainted root-canal and
keeping their reentry are essential to guaranteeing a
good endodontic treatment result. It is by and large
acknowledged that endodontic treatment result is
decidedly corresponded with the specialized nature of
root-canal filling. Root canals which are well filled,
relied upon to give a three dimensional seal against
bacteria entrance.\textsuperscript{10}

The radiographic translation of root-canal filling is
a typical technique used to survey the achievement or
endodontic treatment failure\textsuperscript{6}, along these lines in this
investigation periapical radiographs were utilized to
evaluate the reason for failure of root-canals.

The present examination demonstrated that most
basic explanation behind root-canal failure was under-
obturation of root-canals and the rate was observed to
be 45.50\%. This finding is predictable with that of
numerous local and remote investigations. A radiographic study conducted by Akbar I in 2015 to
decide the reasons for endodontic disappointments and
he found under-obturation filling as a reason for
disappointment in 46.90\% of root-canals.\textsuperscript{11} Similarly
Iqbal\textsuperscript{12} conducted a study at Saudi Arabia in 2016, he
found that under-obturation was the most responsible
factor for failure of endodontic treatment and 33.30%
frequency was reported. Under-filled canals upon radiographic evaluation as reported by Arigbede et al in his study conducted in 2016.13

In 26% of the cases, poor-obturation was observed in the present study which was the second general cause of failure of endodontic treatment. These findings were similar to Akbar I & Rasheed et al studies.12,14

14.50% missed-canals occurrence was found in present study. Deepthi and Praveena reported in a recent study that failure of endodontic treatment caused by untreated canals and these were 13.0%15 but different studies reported failures about to 17.7% & 20.0% because of missed canals.12,14

Another cause of failure of endodontic treatment is root-canals over-obturation which reported in literature. In this present study only 5.0% of cases were found in which over-obturation was the failure cause. These results comparable with the outcomes of Praveena et al14, Rasheed15 and Khan16 but the other studies shown over-obturation percentage at great level.11,12

Another essential reason for root treated teeth failure is iatrogenic errors since they result in root-canal system areas which escape appropriate compound and mechanical debridement bringing about relentless intra-radicular disease. Disappointments because of iatrogenic error in this examination were observed to be 9.0% of aggregate cases. These procedural blunders incorporate isolated instrument, ledge formation, strip perforation, furcal perforation and coronal leakage each with revealed level of 4.0%, 2.5%, 1.5%, 0.5% and 0.5% individually. These outcomes coordinate with the examination by Akbar11 in which instrument detachment was 3.1% and coronal leakage 0.8%. In a recent report conducted at AFID during 2013, the level of instrument division in treatment of root-canal failure cases was additionally answered to be 4%.13 which affirms the unwavering quality of the outcomes delivered by introduce examine. However, the after effects of this examination with respect to coronal leakage as a reason for endodontic treatment failure, contrast from the investigations performed by Iqbal12 and Rasheed et al14, who observed coronal leakage to be available in 14.50% and 3.0% of cases individually. One constraint of current investigation is the utilization of periapical radiographs for assessment of reasons for failure of root-canal treatment since radiographs give two dimensional picture of three dimensional items and super inconvenience of nearby anatomical structures additionally, which make the understanding of radiographs troublesome. Propelled imaging strategies like CBCT can give more important data when contrasted with traditional radiographs and could be more particular for the assessment of reasons for endodontic treatment failure.17

CONCLUSION
During present study, it was come to know that most general reason for initial / beginning root-canal treatment failure was root-canal under-obturation follow by missed canals, over-obturation, iatrogenic errors and poor-obturation.

REFERENCES


