ACCEPTED MANUSCRIPT

Accepted manuscripts are the articles in press that have been peer reviewed and accepted for publication by the Editorial Board of the Vojnosanitetski Pregled. They have not yet been copy edited and/or formatted in the publication house style, and the text could still be changed before final publication.

Although accepted manuscripts do not yet have all bibliographic details available, they can already be cited using the year of online publication and the DOI, as follows: article title, the author(s), publication (year), the DOI.

Please cite this article FOLLOW-UP DENTAL EXAMINATION A DAY AFTER APICOECTOMY USING THE „STORE AND FORWARD“ METHOD

KONTROLNI POSTOPERATIVNI PREGLED DAN POSLE APIKOECTOMIJE „STORE AND FORWARD“ METODOM

Authors Miladinovic Milan*, Zivkovic Dusan*, Zivkovic Milan*, Lazic Zoran†, Karanovic Andrijana*, Mihailovic Djordje*, Šehalić Meliha*, Duka Milos†, Vojnosanitetski pregled (2019); Online First April, 2019.

UDC:

DOI: https://doi.org/10.2298/VSP190125045M

When the final article is assigned to volumes/issues of the Journal, the Article in Press version will be removed and the final version appear in the associated published volumes/issues of the Journal. The date the article was made available online first will be carried over.
FOLLOW-UP DENTAL EXAMINATION A DAY AFTER APICOECTOMY USING THE „STORE AND FORWARD“ METHOD

KONTROLNI POSTOPERATIVNI PREGLED DAN POSLE APIKOEKTOMIJE „STORE AND FORWARD“ METODOM

Miladinovic Milan*, Zivkovic Dusan*, Zivkovic Milan*, Lazic Zoran†, Karanovic Andrijana*, Mihailovic Djordje*, Šehalić Meliha*, Duka Milos†

* University of Pristina (Serbian language in Mitrovica) / Faculty of Medicine, † Military Medical Academy Belgrade, Dental Clinic

Correspondence to:
Prof. Dr Milan D Miladinovic,
Klinika za stomatologiju, Medicinski fakultet Kosovska Mitrovica
Ul. Anri Dinana b.b.
38220 Kosovska Mitrovica, SERBIA
Phone: +381 28 498 298
email: milanbetter@gmail.com

Running title:
Telemedicine in follow-up visits after apicoectomy
Abstract

Introduction: Although apicoectomy is performed routinely and yields excellent results, a close patient observation during the postoperative course is desirable in order to avoid possible complications. This study aims to investigate the adequacy of postoperative control visits a day after surgery using the “store and forward” telemedicine method compared to clinical “in person“ controls.

Methods: There were 122 teeth with apicoectomy performed during 115 dental surgery interventions. Follow-up dental examination a day after apicoectomy consisted of the review of extraoral and intraoral photographs on the Internet and the review of responses to the questionnaire, and after that patients were examined in person. Cohen’s kappa (κ) coefficient, diagnostic sensitivity (SE), sensitivity (SP) and efficiency were determined. Statistical significance and comparisons were performed using the Z-test, and non-parametric characteristics were tested using McNemar’s χ²-test at the statistical significance cut-off value of p=0.05.

Results: The patients reported for control dental examination in 106 (92%) cases. The agreement between “in person“ and “store and forward“ telemedicine method was found in 104 cases (98%). The obtained agreement values indicated an almost complete diagnostic agreement.

Conclusion: Based on the Internet transmission of digital photographs of the patients and accompanying patient medical history records, the study showed that control dental examinations “in person“ can be successfully replaced with distance “store and forward“ method of telemedicine.

Key words: telemedicine, teledentistry, follow-up visit, apicoectomy.

Apstrakt

Uvod: Iako se rutinski izvodi i daje veoma uspešne rezultate, neophodno je adekvatno ispratiti postoperativni tok zbog eventualnih komplikacija. Cilj ovog istraživanja
je bio ispitati tačnost post operativnih kontrola dan posle internvencije store and forward metodom u odnosu na IN-PERSON kontrolu na klinici.

**Metode:** Apikotomirano je 122 zuba u 115 hirurških operacija. Kontrolni pregled dan posle apikoektomije je urađen WEB pregledom ekstraoralnih i intraoralnih fotografija pacijenta i pregledom odgovora upitnika, a potom je pacijent pregledan IN-PERSON. Određena je saglasnost Cohen-ovim kappa (k) koeficijentom, dijagnostička senzitivnost (SE), specifičnost (SP) i efikasnost (EFF). Statistička značajnost i poređenja vršena su Z-testom, a testiranje neparametarskih obeležja Mc Nemmar-ovim $\chi^2$ kvadrat testom za prag značajnosti od $p=0.05$.

**Rezultati:** Na kontrolni pregled pacijenti su se javili u 106 (92%) slučajeva. Slaganje između IN-PERSON direktnog pregleda, i Store And Forward metodom telemedicine bilo je u 104 slučaja tj. 98%. Dobijene vrednosti saglasnosti su kappa = 0,85, Sensitivity = 0,99, Specificity =0,86, Efficiency = 0,98, što ukazuje na skoro potpuno dijagnostičku saglasnost.

**Zaključak:** Bazirana na Internet prenosu digitalnih fotografija pacijenta i pratećih anamnestičkih podataka, studija pokazuje da se kontrolni pregled IN-PERSON može adekvatno zameniti udaljenim STORE AND FORWARD telemedicinskim pregledom.

**Ključne reči:** telemedicina, telestomatologija, kontrolni pregled, oralna hirurgija, apikoektomija.

**Introduction**

An ideal method of telemedicine would be almost identical to the method described several thousand years ago: an individual with the disease, regardless of his whereabouts, contacts the physician (his words reaching the physician faster than light), and the physician (using a magic cure) heals the patient from a distance. Although having been sought for thousands of years, the method is still the ideal we are thriving to reach.

Dental treatment, which is greatly improved in recent decades has made preservation of many natural teeth possible with minimal collateral damage. Apicoectomy
(periapical surgery) is such a combination method, representing the last line of defence of a natural tooth before extraction. It is indicated when non-surgical approaches of endodontics are unable to preserve the tooth, and is employed routinely in appropriate cases\(^*\). Apicoectomy itself is an oral surgery approach that removes apical portion of the dental root and adjacent tissue all the way to the healthy tissue, with the percentage of success ranging from 65% to 95.2%, depending on various factors, such as the type of indication for surgery, tooth type, patient age, etc\(^*\). Apicoectomy is usually performed under local anaesthesia, in a single surgical session, after which postoperative therapy is always prescribed to the patient and he is discharged from the clinic. Certain discomforting sensations are usually felt after surgery, usually implying postoperative pain, swelling, difficult swallowing, and similar. A control dental follow-up examination is therefore necessary, for which an appointment has to be made. At this examination, a dental surgeon usually establishes local and general findings after surgery. Although a level of discomfort is usual and expected after apicoectomy, some minor or major postoperative complications may occur as well. Based on the above mentioned control examination, an insight is made and decisions are agreed upon on the continuation, change or supplementation of the prescribed postoperative therapy\(^*\). Because of the importance of follow-up of the postoperative course, this control dental follow-up examination a day after periapical surgery is strongly recommended\(^*\).

Our study aimed to investigate validity of distance postoperative control examination a day after dental apicoectomy, using the „store and forward“ method.

**Methods**

In the period from 2016 to 2018, this experimental randomized study performed at the Faculty of Medicine in Kosovska Mitrovica enrolled 97 randomly selected patients of both genders, aged 14 to 77 years (mean age, 37 years; range, 14-77 years). The study was approved by Ethics Committee of Faculty of Medicine in Kosovska Mitrovica. There were 34 men and 63 women. There were 122 apicoectomies in total, out of which 70 in the upper jaw and 52 in the lower jaw (Table 1). The reasons for apicoectomy were as follows: a) periapical disease of the permanent tooth after failure of endodontic treatment; b) periapical disease of the tooth which had been prosthetically or conservatively managed and the
removal of which was not easily feasible; c) radio-transparent lesion 8 mm or more in size;
d) forced root canal filling or the presence of a foreign body which could not be removed in
an orthograde fashion; and e) other indications (the patient insisting on endodontic-surgical
management in a single session, dental root fracture in the apical third, etc.\textsuperscript{17}.

There were 131 apicoectomised dental roots, out of which 107 (82\%) were filled in
an orthograde fashion and 16 (12\%) in retrograde fashion. In 8 cases (6\%) re-intervention
was done.

There were 115 apicoectomies, out of which in 25 cases (22\%) sulcular flap was
used, in 21 (18\%) triangular flap, in 25 (22\%) trapezoidal flap, in 25 (22\%) semilunar flap,
in 6 (5\%) submarginal scalloped flap, in 10 (9\%) submarginal straight flap, and in 3 (3\%)
vertical flap (acc. Eskici)\textsuperscript{18}.

Out of 115 performed apicoectomies, in 106 cases (93\%) control follow-up
examination was done a day after surgery, while in 9 cases (7\%) the patients did not for the
follow-up examination. The control examination a day after apicoectomy was performed in
the following way. Patients were received by a dentist who did not perform periapical
surgery. Three extra-oral photographs were taken of the patient’s head: one facial and two
en face bilaterally, as well as one intraoral photograph focusing on the area of apicoectomy
with lips and cheeks retracted by an assistant. The photographs were taken using Samsung
S7 Galaxy EDGE mobile phone (SM-G935F), measuring 2595x1458 pixels, with
horizontal and vertical resolution of 150 dpi and 24 bits and sRGB colour representation, in
.jpg format. The photographs were taken under flash light, regardless of the lighting
conditions in the examination room. The distance between the patient and camera was 5-10
cm for intraoral photo, and 30-50 cm for extra-oral photo. Patients were also asked to
respond to a questionnaire (Table 2)\textsuperscript{8,10,11,12,13,16}.

The photographs taken were uploaded to a web server (the web server represented
an internally developed ASP.NET Internet application, at the web address
teleapicoectomy.xpa3.com, the access to which was authorized and authenticated and
protected using a 256-bit SSL (Secure Sockets Layer) security protocol. The web server
application made a recording for postoperative follow-up control examination, written
down in the Microsoft SQL Server 2014 Express data base. Three individual .jpg files were
uploaded and recorded onto the SSD server disk, with each file getting a unique name
based on the generation of GUID value\textsuperscript{19} and .jpg file extension. The names of the files
generated thus were written into the data base table, serving as a reference for subsequent access to these files. Into the other data base fields responses to the questionnaire were entered, as well as other associated service information (upload information, such as date, time, user, and similar). Data collection and upload were thus completed.

Digital tele-medical control examination followed after that. An oral surgeon accessed the server application at the web address teleapicoectomy.xpa3.com, and after authentication and authorization, under a 256-bit security protocol, examined the patient virtually based on the four photographs and questionnaire responses presented to him on the HTML page of the browser. A click on the photograph opened it in a separate window - it was possible to be enlarged or additionally manipulated in other ways. Based on the performed digital examination, the oral surgeon established tele-dentistry status of the patient in question, i.e. his postoperative diagnosis. After the digital follow-up control examination, the oral surgeon directly examined (in person) the patient in dental examination chair for about 10 minutes. Thereafter, he established the postoperative status of the patient again for postoperative diagnosis.

The degree of diagnostic accuracy was determined in accordance with the following scale:

- Correct - if the telemedicine postoperative diagnosis was identical to the primary diagnosis or it was as an acceptable differential diagnosis, and
- Incorrect - if the telemedicine postoperative diagnosis completely differed from the primary diagnosis, or the diagnosis was not established at all.

Statistical data processing and analysis of the obtained results was performed using the Med Calc version 18.6 for Windows and DAG (Diagnostic and A Greement Statistics Software). The agreement between examinations was obtained as the ratio of the number of examinations with agreement and the total number of examinations. Sensitivity (SE), specificity (SP) and efficiency (EFF) were also measured. The degree of obtained agreement between examinations using the method of telemedicine was established using the Cohen’s kappa (κ) coefficient. Kappa coefficient for the confidence interval of 95% was presented in accordance with the Landis and Koch scale (Table 3). Statistical significance of the differences between the correct and incorrect diagnoses, accuracy, sensitivity and specificity, and comparisons of all the obtained values were performed.
using the Z-test, and testing for non-parametric characteristics, which was done using McNemmar chi-square ($\chi^2$) test (contingency table 2x2) at the significance threshold of $p=0.05$.

Results

Out of 115 apicoectomies, 106 patients (92%) returned a day after the intervention for the follow-up control examination, while 9 patients (8%) did come (Table 4).

Oral surgeons reported general and local findings in 99 cases (94%) out of 106 cases using both methods (telemedicine and in-person), with the previously prescribed postoperative therapy to be continued without any changes. Out of that, in 98 cases (92%) the findings were identical (in order), while in one case telemedicine findings showed continuance and compliance with the prescribed therapy, and in-person findings showed that postoperative anti-oedematous therapy could be withdrawn. Furthermore, in one case, telemedicine indicated the need for antibiotic and anti-oedematous therapy to be increased, and in-person method showed that the findings were in order, without a need to correct the therapy.

In 7 cases (7%), both methods indicated a need for postoperative therapy to be changed. Nevertheless, 6 cases out of 7 (86%) were identical, while 1 case (14%) was differently assessed by different methods. The difference was reflected in different assessment of the size and characteristics of postoperative oedema and in consequential correction of postoperative therapy (Table 5).

Out of 106 control follow-ups, the agreement of “in person” direct examination and “store and forward” method was found in 104 (98%) cases (Table 6). The obtained agreement values were as follows: kappa = 0.85, Sensitivity = 0.99, Specificity = 0.86, Efficiency = 0.98, indicating an almost complete diagnostic agreement (Table 7). Diagnostic differences were not statistically significant.

Discussion

The focus of our investigation were the real possibilities of distant follow-up of patient recovery a day after oral surgery, apicoectomy. Based on Internet transmission of digital photographs of the studied patients and their responses to the questionnaire, our
In fact, the primary concern of a dentist after apicoectomy is postoperative recovery of the patient. This involves the exclusion of postoperative complication, or if they still occur, their timely diagnosis and adequate therapeutic management. Timely and proper postoperative diagnosis prevents the progress of possible postoperative complications and speeds up patient recovery all the way to a complete cure. Our study demonstrates that telemedical approach can be used to follow-up the patient and to assess adequately the need for postoperative therapy correction. It should be mentioned that there were no misdiagnoses of postoperative complications or the needs for additional treatment corrections when telemedical approach was used. In cases that telemedical postoperative control examination after apicoectomy should suggest a complication or a need for therapy correction, oral surgeons may react remotely and correct the therapy or, if needed, refer the patient for hospital treatment.

The concept represents an advancement of the initial idea that teledentistry is primarily intended to help dentists to manage patients at remote locations. In fact, in an age in which smart phones with quality cameras are widely available, and Internet access is also widespread, an idea readily comes to mind that patients may take a couple of selfies and write some comments about their condition, and report thus their own postoperative status to the dentist without leaving their home (naturally, with some appropriate instructions or perhaps a step-by-step tutorial).

We have not been able to find in the literature any studies investigating the possibility of telemedicine use in the follow-up after oral surgery (nor after dental treatments for that matter), but there is a number of studies dealing with postoperative recovery of patients in other medical disciplines. A study investigating online postoperative recovery of general surgery patients of the Vanderbilt University Medical Center, with patients who underwent elective laparoscopic cholecystectomy, laparoscopic ventral hernia repair, umbilical hernia repair, or inguinal hernia repair, showed that online follow-up of postoperative recovery was equal to visits to the clinic for 68% of doctors and patients, that 24% of doctors and patients preferred visits to the clinic, and 8% preferred online examinations. A systematic review protocol analysis of 1,413 studies of postoperative recovery.
follow-up of discharged patients, identified 7 studies dealing with a potential replacement of follow-up clinic visits with phone communication or online video-conference calls; the study found a high degree of satisfaction of both patients and doctors, and a high degree of success of telemedical approach as an alternative to postoperative clinical examination. Telemedicine can be successfully used in the coverage of intensive care unit (ICU) beds during the postoperative period. Telerehabilitation is recommended for patients after total knee arthroplasty, with better results compared to face-to-face rehabilitation approach. Telemedicine has definitely come forth as a future method in the postoperative follow-up of surgically treated patients.

On the other hand, dentistry has its specific aspects, but the reliability of transfer and review of digital photographs illustrating the status of the mouth cavity and teeth for the purpose of diagnosis of numerous dental and mouth cavity conditions, has been confirmed in a number of studies.

Telemedical follow-ups after apicoectomy have numerous associated benefits for both the patient and his oral surgeon. Some of them are as follows: a newly operated patient does not have to take trouble going to visit their oral surgeons for control (in many cases patients are at remote locations, and then they can continue recovering without the need for transportation). Expenses are then reduced and valuable time is saved for both the patient and his surgeon. Oral surgeons may plan their operations for the last days of the week, and follow-up patient recovery via the Internet even out of office. Patients after the surgery are allowed to travel (they are not bound by the obligation to visit the clinic), to continue with their professional activity, etc.

In the near future, a complete shift to telemedical approach could be envisaged for patient follow-up visits after apicoectomy, with the establishment of photography standards and precise definition of patient condition questionnaire after this oral surgery.

Future research should be directed towards telemedical control of the postoperative course in other routine dental surgery treatments, primarily complicated dental extractions, surgical dental extractions, and out-patient patient recovery follow-up in cases of odontogenic infections. The need for “in person” control examinations will be considerably reduced, relieving from this burden both the patient and his dentist in the days immediately following oral surgery.
Conclusion

Comparing follow-up examinations using the methods of “store and forward” and “in person” a day after apicoectomy, the obtained results show an almost complete agreement, suggesting that this telemedical approach can be safely used to perform the above follow-up examinations.

Declaration of Conflicting Interests

The author(s) declare no conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

References

4. Ho C, Argáez C. Endodontic Therapy Interventions for Root Canal Failure in Permanent Dentition: A Review of Clinical Effectiveness, Cost-Effectiveness, and


Tables

Table 1 – Apicoectomy distribution by tooth types and jaws

<table>
<thead>
<tr>
<th></th>
<th>Incisors and canines</th>
<th>Premolars</th>
<th>Molars</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Upper jaw</strong></td>
<td>37 53%</td>
<td>25 36%</td>
<td>8 11%</td>
<td>70 100%</td>
</tr>
<tr>
<td><strong>Lower jaw</strong></td>
<td>23 44%</td>
<td>22 42%</td>
<td>7 13%</td>
<td>52 100%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>60 49%</td>
<td>47 39%</td>
<td>15 12%</td>
<td>122 100%</td>
</tr>
</tbody>
</table>
Table 2 – Patient questionnaire at the follow-up control examination

<table>
<thead>
<tr>
<th>Question</th>
<th>Patient response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How are you today?</td>
<td></td>
</tr>
<tr>
<td>2. Do you have any pain?</td>
<td></td>
</tr>
<tr>
<td>3. Do you regularly take your prescribed therapy?</td>
<td></td>
</tr>
<tr>
<td>4. Is your swelling enlarging or shrinking?</td>
<td></td>
</tr>
<tr>
<td>5. Was there any bleeding?</td>
<td></td>
</tr>
<tr>
<td>6. Are there any discomforts or similar complaints?</td>
<td>If there are, name and describe them.</td>
</tr>
<tr>
<td>7. Other comments</td>
<td></td>
</tr>
</tbody>
</table>

Table 3 – Kappa coefficient and degree of diagnostic agreement (*Landis* and *Koch*)

<table>
<thead>
<tr>
<th>Kappa (k) coefficient</th>
<th>Degree of agreement</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 0</td>
<td>No agreement</td>
</tr>
<tr>
<td>0.01–0.20</td>
<td>Slight agreement</td>
</tr>
<tr>
<td>0.21–0.40</td>
<td>Sufficient agreement</td>
</tr>
<tr>
<td>0.41–0.60</td>
<td>Moderate agreement</td>
</tr>
<tr>
<td>0.61–0.80</td>
<td>Considerable agreement</td>
</tr>
<tr>
<td>0.81–0.99</td>
<td>Almost complete agreement</td>
</tr>
<tr>
<td>1</td>
<td>Complete agreement</td>
</tr>
</tbody>
</table>
Table 4 – Number of patients and controls

<table>
<thead>
<tr>
<th></th>
<th>Number of patients and controls</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Patient number</td>
<td>%</td>
<td>Number of interventions</td>
<td>%</td>
<td>Number of follow-up controls</td>
</tr>
<tr>
<td></td>
<td>97 (100%)</td>
<td>115 (100%)</td>
<td>106 (92%)</td>
<td>9 (8%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Men 34 (35%)</td>
<td>38 (33%)</td>
<td>35 (33%)</td>
<td>3 (33%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Women 63 (65%)</td>
<td>77 (67%)</td>
<td>71 (67%)</td>
<td>6 (67%)</td>
<td></td>
</tr>
</tbody>
</table>
Table 5 – Distribution of agreement and different attitudes in two methods

<table>
<thead>
<tr>
<th>Method</th>
<th>Number of controls</th>
<th>Finding in order, Th IDEM</th>
<th>Additional treatment</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>IN-PERSON</strong></td>
<td>106</td>
<td>99</td>
<td>7</td>
<td>7%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Removal of one or more sutures</strong></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Drain placement</strong></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Correction of antibiotic therapy</strong></td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Correction of anti-oedematous therapy</strong></td>
<td>3</td>
</tr>
<tr>
<td><strong>TELEMEDICINE</strong></td>
<td>106</td>
<td>99</td>
<td>7</td>
<td>7%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Removal of one or more sutures</strong></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Drain placement</strong></td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Correction of antibiotic therapy</strong></td>
<td>7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Correction of anti-oedematous therapy</strong></td>
<td>2</td>
</tr>
</tbody>
</table>
Table 6 – Agreement (kappa)

<table>
<thead>
<tr>
<th>TELEMEDICINE</th>
<th>0</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>98</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>99</td>
<td>7</td>
</tr>
</tbody>
</table>

Weighted Kappa: 0.84704
Standard error: 0.10617
95% CI: 0.63896 to 1.00000

Table 7 – Agreement statistics

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity</td>
<td>0.99 (95% CI: 0.95 - 1.00)</td>
</tr>
<tr>
<td>Specificity</td>
<td>0.86 (95% CI: 0.42 - 1.00)</td>
</tr>
<tr>
<td>Efficiency</td>
<td>0.98 (95% CI: 0.93 - 1.00)</td>
</tr>
<tr>
<td>Cohen’s Kappa</td>
<td>0.85 (95% CI: 0.64 - 1.06)</td>
</tr>
<tr>
<td>Observed Agreement</td>
<td>0.98 (95% CI: 0.93 - 1.00)</td>
</tr>
<tr>
<td>Chance Agreement</td>
<td>0.88 (95% CI: 0.00 - 0.00)</td>
</tr>
<tr>
<td>Positive Agreement</td>
<td>0.99 (95% CI: 0.98 - 1.00)</td>
</tr>
<tr>
<td>Negative Agreement</td>
<td>0.86 (95% CI: 0.66 - 1.05)</td>
</tr>
</tbody>
</table>

This kappa indicates almost perfect agreement.

Test of Ho: Kappa=0: z=8.72, p =0.0000 t.t.t.