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ORIGINAL CLINICAL ARTICLE

# Efficiency and satisfaction with telephone consultation of follow-up patients in neuro-urology: Experience of the COVID-19 pandemic

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## Abstract

**Aim:** The COVID-19 pandemic led to limit patients' visits to the neuro-urology department. Telemedicine was seen as a pragmatic solution to provide follow-up care. This study aimed to assess the efficiency and satisfaction of a telephone consultation in neuro-urology.

**Methods:** During the pandemic, the scheduled medical visits were converted into telephone consultation. For each teleconsultation, the physician assessed the efficiency and the patient-rated global satisfaction of the teleconsultation. The physician and the patient assessed whether this teleconsultation replaced a physical visit.

**Results:** About 358 neurologic patients were included in the study. The mean efficiency of the telephone consultation was 9.3/10 (±1.5). The mean global satisfaction was 9.0/10 (±1.3). The majority of the patients (52.4%) would prefer a physical consultation. 90.2% might convert some clinic visits to teleconsultations in the future. No agreement was found between the patient and the physician when they were asked if the teleconsultation replaced the physical consultation initially scheduled (weight kappa = 0.02; 95% confidence interval = [−0.06 to 0.11]). Cognitive impairment, difficulty to obtain relevant information, and lack of physical examination were unfavorable to the efficiency of the teleconsultation. Cognitive impairment, embarrassing nature of the teleconsultation, and preference for a physical consultation were unfavorable to satisfaction of the patient.

**Conclusion:** Telemedicine in neuro-urology was associated with a high satisfaction of the patients and was described as efficient by the physicians. Despite this, the majority of the patients reported a preference for physical consultation. The COVID-19 pandemic might be an opportunity to refine our practices in neuro-urology and to develop telemedicine.

KEYWORDS

COVID-19, efficacy, neuro-urology, patient satisfaction, telemedicine

  

# 1 | INTRODUCTION

The coronavirus disease 2019 (COVID-19) pandemic led to drastic measures to limit the spread of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The stay home policies and the express instruction to postpone nonurgent consultations limited the clinic visits including urological.[1] In this context, telemedicine was a pragmatic solution to provide follow-up care for patients.

During the past 20 years, telemedicine developed providing access to specialized care despite physical or geographic barriers, with cost effectiveness.[2,3]

In neurology, telemedicine is effective with a good satisfaction for patients and caregivers.[4] Similarly in urology, telemedicine improves access to health care and shows favorable results.[5,6] To our knowledge, telemedicine has never been studied in the specific field of neuro-urology. However, patients consulting in the neuro-urology department often present disabilities making traveling complicated and requiring the presence of caregivers during medical visits. In addition, the follow-up of these patients requires numerous stays in the neuro-urology department, with all the known consequences in terms of adherence to treatment, general satisfaction, personal discomfort, and medical and general health costs. Telemedicine could be an asset in neuro-urology. The International Continence Society (ICS) recently highlighted the need to evaluate telemedicine in neuro-urology.[7]

During the COVID-19 pandemic, we deployed telemedicine in our neuro-urology department to ensure the follow-up of the patients. Indeed, neuro-urologic patients are at risk for uro-nephrological complications such as persistent urinary incontinence, vesico-renal reflux, and recurrent urinary tract infections. Due to the delay in deploying teleconsultation (with video tools) and the cognitive impairment of some of our patients, we performed telephone consultation.

The aim of the study was to assess the efficiency and satisfaction of a telephone consultation as an alternative to a physical consultation.

# 2 | MATERIALS AND METHODS

## 2.1 | Study design

The study was conducted in a neuro-urology department of a French university hospital between March 16th and June 1st. During the stay home policies for the COVID-19 pandemic and until June 1st, all the scheduled medical visits were converted into telephone consultation. New patients were not included because of the risk of misdiagnosis due to lack of physical examination. Only patients with neurological disease were included.

## 2.2 | Procedure

All physicians conducted the teleconsultations by telephone, without the use of video tools. For each teleconsultation, the physician reported the duration of the consultation and the number of tries to join the patient. The physician rated on a numerical scale of 0–10, the efficiency of the consultation, that is, the ability to understand, to analyze the patient's symptoms, to rule out an urgent situation, to propose a therapeutic adaptation, and to plan a later appointment.

At the same time, the physician rated the difficulty to obtain relevant information due to the phone way of the consultation and the lack of physical examination in the understanding of the patient's pathology and reported symptoms.

On the next days, a nurse phoned the patient and he rated on a numerical scale of 0–10, the satisfaction of being phoned by the physician, how the teleconsultation was embarrassing, and the global satisfaction of the teleconsultation. The patient reported if (a) he had enough time for teleconsultation (b) he got all the answers to his queries, (c) he would prefer to have a physical consultation, and (d) if, in the future, he may consider converting some clinic visits to teleconsultations. The physician and the patient assessed whether this telephone consultation has replaced a physical visit. We recorded the following data: the need to take a day-off for face-to-face consultation and for a telephone consultation, the usual transportation mode of the patient to the department, and the distance between the patient's home and the hospital. The physician reviewed the patient's chart and noted the diagnosis, the presence of cognitive impairment, mobility aids (walking stick, wheelchair), and the number of appointments spent in the department.

## 2.3 | Statistical analysis

Statistical analyses were performed with R and RStudio softwares. Means, percentages, and *SD* (standard deviations) were used to describe the results. The relation between satisfaction of the teleconsultation and demographic data was assessed on univariate analysis with *t*-test or variance analysis for categorical variables with more than two modalities and with Pearson correlation for quantitative variables. A linear regression model was applied to search for related factors to patient satisfaction and physician efficiency in multivariate analysis. Agreement between patient and physician was evaluated using a weight kappa (wkappa) for

categorical data. The 95% confidence interval (CI) was calculated using the bootstrap method. The value of $p < 0.05$ was considered statistically significant.

### 2.4 | Ethics

All the patients gave their consent for the teleconsultation and the study. This study was approved by a local ethics committee. All the data were anonymous and the study was performed in accordance with European regulation no. 2016/679, known as the general regulation on data protection. This study was registered on clinicaltrials.gov: NCT04341714.

## 3 | RESULTS

### 3.1 | Patients' characteristics

Physician evaluated the telephone consultation for the 358 patients included in the study. Three hundred twenty-eight patients (91.6%) evaluated the telephone consultation. Regarding the 30 patients' withdrawal: 23 were unreachable, 4 could not respond due to significant cognitive impairment or language barrier, and 3 refused to rate the teleconsultation. The mean age was 55.4 years ($SD = 14.2$), 211 (58.9%) were women. One hundred seventy-seven patients (49.4%) had multiple sclerosis and 44 (12.3%) spinal cord injury. Patients were followed in the department for an average of 66.6 months ($SD = 58.8$). To come for physical consultation, 37.3% of the patients used medical transport. Patients' characteristics are provided in Table 1.

**TABLE 1** Characteristics of study participants

| | Mean (*SD*)/*n* (%) |
|---|---|
| **Age** | 55.4 ± 14.2 |
| **Sex** | |
| Female | 211 (58.9%) |
| Male | 147 (41.1%) |
| **Etiology** | |
| Multiple sclerosis | 177 (49.4%) |
| Spinal cord injury | 44 (12.3%) |
| Cauda equina syndrome or lower motoneuron disease | 61 (17.0%) |
| Spina-bifida or mixt | 29 (8.1%) |
| Neurological-others (supra-pontic disease) | 47 (13.1%) |
| **EDSS** | 4.6 ± 1.8 |
| **Cognitive impairment**[a] | 103 (29.3%) |
| **Mobility aids** | |
| Walking stick/walker | 98 (12.8%) |
| Wheelchair | 32 (8.9%) |
| **Number of past appointments in the department** | 11.8 ± 10.2 |
| **Usual transportation mode**[b] | |
| Ambulance | 37 (11.1%) |
| Medical transport in sitting position | 87 (26.2%) |
| **Distance between patients' home and the department of neuro-urology (km)** | 49.4 ± 91.5 |
| **Need to take a day-off**[c] | |
| For face-to-face consultation | 80 (24.4%) |
| For telephone consultation | 23 (7.0%) |

Abbreviations: EDSS, Expanded Disability Status Scale for patients with multiple sclerosis (4 missing data out of 177 patients); Etiology mixt, both upper and lower motoneuron disease involvement; LUTS, lower urinary tract symptoms; SD, standard deviation.

[a]Number of patients = 351 (7 missing data).

[b]Number of patients = 332 (26 missing data).

[c]Number of patients = 328 (30 missing data).

### 3.2 | Cost analysis

To come for physical consultation, 124 patients (37.3%) used medical transport. The mean cost of the medical transport in our cohort would have been €171.1 ($SD = 131.7$). The total cost for medical transport to come for the face-to-face consultation would have been €21 221.1. Eighteen patients (24.4%) would have to take a day-off to come to the consultation. Only 23 patients (7.0%) had to take a day-off for the telephone consultation.

### 3.3 | Physicians' evaluation of the teleconsultation

According to the physicians, the efficiency of the telephone consultation was good with a mean numeric scale at 9.3/10 ($SD = 1.5$). Fifteen teleconsultations (4.2%) were regarded as inefficient (defined by a numerical scale ≤ 5). The physicians felt that 90.5% of the performed teleconsultations replaced the scheduled physical consultation. Results of the physicians' evaluation of the telephone consultation are reported in Table 2.

### 3.4 | Patients' evaluation of the teleconsultation

Patients were satisfied with the teleconsultation, the mean global satisfaction was 9.0/10 ($SD = 1.3$). Six patients (1.8%) reported that the teleconsultation was unsatisfactory (defined

**TABLE 2** Results of physicians' evaluation of telephone consultation

| | Mean (*SD*)/ *n* (%) |
|---|---|
| **Duration of teleconsultation** (min) | 18.5 ± 8.4 |
| **Number of tries to reach the patient** | 1.6 ± 0.9 |
| **Efficiency of the consultation** (numerical scale of 0–10) | 9.3 ± 1.5 |
| Inefficient TCS (numerical scale ≤ 5) | 15 (4.2%) |
| **Difficulty to obtain relevant information due to the phone way** (numerical scale of 0–10) | 1.0 ± 2.0 |
| Difficult TCS (numerical scale ≥ 5) | 3 (0.9%) |
| **Lack of physical examination** (numerical scale of 0–10) | 0.6 ± 1.9 |
| Significant lack (numerical scale ≥ 5) | 3 (0.9%) |
| **Teleconsultation replacing physical visit** | 324 (90.5%) |

*Note*: Number of patients = 358.

Abbreviations: SD, standard deviation; TCS, teleconsultation.

by a numerical scale ≤ 5). The majority (52.4%) would prefer a physical consultation. The large majority of the patients (90.2%) might consider converting some clinic visits to teleconsultations in the future. Two hundred twenty patients (67.1%) reported that the performed teleconsultation replaced the scheduled physical consultation. Details of the patients' evaluation of the telephone consultation are reported in Table 3.

## 3.5 | Agreement between physicians and patients

No agreement was found between the patient and the physician when they were asked if the teleconsultation replaced the physical consultation initially scheduled (wkappa = 0.02; 95% CI = [−0.06 to 0.11]).

## 3.6 | Factors related to physicians evaluation of the teleconsultation

In univariate analysis, the efficiency of the teleconsultation assessed by the physician was linked with the duration of the consultation $\rho = -0.1$ ($p < 0.001$); difficulty to obtain information $\rho = -0.7$ ($p < 0.0001$); lack of physical examination $\rho = -0.5$ ($p < 0.001$); etiology of lower urinary tract symptoms ($p < 0.001$) and cognitive impairment (efficiency at 9.0/10 in patients with cognitive impairment vs. 9.4/10 for patients without cognitive impairment, $p = 0.02$; Table 4). In multivariate analysis, two models were applied: first with demographic data and second regarding the evaluation of the teleconsultation. Using a walking stick was associated with greater efficiency. Cognitive impairment, difficulty to obtain relevant information, and lack of physical examination remained statistically unfavorable to the efficiency of the teleconsultation (Table 4).

**TABLE 3** Results of patients' evaluation of telephone consultation

| | Mean (*SD*)/ *n* (%) |
|---|---|
| **Satisfaction of being phoned by the physician** (numerical scale of 0–10) | 9.5 ± 1.0 |
| Unsatisfactory of being phoned (numerical scale ≤ 5) | 3 (0.9%) |
| **Embarrassing nature of the TCS** (numerical scale of 0–10) | 0.4 ± 1.3 |
| Embarrassing TCS (numerical scale ≥ 5) | 8 (2.4%) |
| **Global satisfaction of the TCS** (numerical scale of 0–10) | 9.0 ± 1.3 |
| Unsatisfactory TCS (numerical scale ≤ 5) | 6 (1.8%) |
| **Number of patients who felt they had enough time for the TCS** | 316 (96.3%) |
| **Number of patients who felt they had all the answers to their queries** | 312 (95.1%) |
| **Number of patients who would have preferred a physical consultation** | |
| Yes | 172 (52.4%) |
| Without opinion | 8 (2.4%) |
| No | 149 (45.4%) |
| **Number of patients who may considered converting some clinic visits to teleconsultations in the future** | |
| Yes | 296 (90.2%) |
| Without opinion | 10 (3.0%) |
| No | 50 (15.2%) |
| **Teleconsultation replacing physical visit** | |
| Yes | 220 (67.1%) |
| Without opinion | 3 (0.9%) |
| No | 106 (32.3%) |

*Note*: Number of patients = 328.

Abbreviations: SD, standard deviation; TCS, telephone consultation.

## 3.7 | Factors related to patients evaluation of the teleconsultation

In univariate analysis, global satisfaction of the teleconsultation rated by the patients was linked with

**TABLE 4** Related factors with efficiency of the teleconsultation rated by the physician

| | Means (*SD*)/$\rho$ | *p* | Multivariate analysis, $\beta$ (*p*) |
|---|---|---|---|
| **Age**[a] | −0.09 | 0.10 | 1.0 (0.06) |
| **Sex**[a] | | 0.30 | |
| Female | 9.4 ± 1.3 | | Reference |
| Male | 9.2 ± 1.8 | | 0.9 (0.36) |
| **Etiology** | | <0.001* | |
| Multiple sclerosis | 9.6 ± 1.2 | | |
| Spinal cord injury | 9.5 ± 1.1 | | |
| Cauda equina syndrome or lower motoneuron disease | 8.8 ± 1.7 | | |
| Spina-bifida or mixt | 9.4 ± 1.7 | | |
| Neurological-others (supra-pontic disease) | 8.7 ± 2.0 | | |
| **Cognitive impairment**[a] | | 0.02* | |
| No | 9.4 ± 1.3 | | Reference |
| Yes | 9.0 ± 1.9 | | 0.6 (0.003)* |
| **Mobility aids**[a] | | 0.09 | |
| None | 9.3 ± 1.5 | | Reference |
| Walking stick/walker | 9.5 ± 1.1 | | 1.5 (0.03)* |
| Wheelchair | 8.8 ± 2.4 | | 0.8 (0.33) |
| **Number of past appointments in the department** | −0.02 | 0.74 | |
| **Distance between patient's home and the department**[a] | 0.01 | 0.91 | 1.0 (1.0) |
| **Duration of the TCS**[b] | −0.13 | 0.02* | 1.0 (0.1) |
| **Difficulty to obtain relevant information due to the phone way**[b] | −0.65 | <0.001* | 0.7 (<0.001)* |
| **Lack of physical examination**[b] | −0.51 | <0.001* | 0.8 (<0.001)* |

*Note*: Number of patients = 358.

Abbreviations: SD, standard deviation; TCS, telephone consultation.

[a]Linear regression model a with demographic data.

[b]Linear regression model b with evaluation of the teleconsultation data.

*$p < 0.05$.

obtaining all the answers to queries (9.1/10 vs. 7.8/10; $p = 0.04$) and with the preference of a physical consultation (8.7/10 vs. 9.4/10; $p < 0.001$). Global satisfaction of the patients correlated with the satisfaction of being phoned ($\rho = 0.55$; $p < 0.001$) and the embarrassing nature of the telephone consultation ($\rho = -0.24$; $p < 0.001$; Table 5). In multivariate analysis, cognitive impairment, embarrassing nature of the teleconsultation, and preference for a physical consultation were unfavorable to satisfaction of the patient. The satisfaction of being called by the physician stayed associated with better satisfaction (Table 5).

## 4 | DISCUSSION

Patients reported high satisfaction with telephone consultation; yet half of the patients would have preferred a physical consultation and two-third felt that teleconsultation had replaced a physical consultation. The majority of the patients favored replacing some of their future consultations with teleconsultation. For the physicians, efficiency of the teleconsultations was very good and replaced the physical consultation 9 times out of 10. Difficulty to obtain relevant information and lack of physical examination were associated with lower efficiency rated by the physician. The satisfaction was lower

**TABLE 5** Related factors with global satisfaction of the teleconsultation rated by the patients

| | Means (*SD*)/$\rho$ | *p* | Multivariate analysis, $\beta$ (*p*) |
|---|---|---|---|
| **Age**[a] | −0.06 | 0.25 | 1.0 (0.23) |
| **Sex**[a] | | 0.34 | |
| Female | 9.0 ± 1.3 | | Reference |
| Male | 9.1 ± 1.2 | | 1.1 (0.39) |
| **Etiology** | | 0.33 | |
| Multiple sclerosis | 9.1 ± 1.2 | | |
| Spinal cord injury | 9.2 ± 1.1 | | |
| Cauda equina syndrome or lower motoneuron disease | 8.8 ± 1.3 | | |
| Spina-bifida or mixt | 9.0 ± 1.1 | | |
| Neurological-others (supra-pontic disease) | 8.8 ± 1.8 | | |
| **Cognitive impairment**[a] | | 0.05 | |
| No | 9.1 ± 1.1 | | Reference |
| Yes | 8.8 ± 1.5 | | 0.63 (0.006)* |
| **Mobility aids**[a] | | 0.57 | |
| None | 9.0 ± 1.2 | | Reference |
| Walking stick/walker | 9.0 ± 1.4 | | 1.2 (0.22) |
| Wheelchair | 9.2 ± 1.1 | | 1.6 (0.08) |
| **Number of past appointments in the department** | −0.05 | 0.35 | |
| **Distance between patient's home and the department**[a] | 0.03 | 0.60 | 1.0 (0.50) |
| **Duration of the TCS** | 0.01 | 0.91 | |
| **Satisfaction of being phoned by the physician**[b] | 0.55 | <0.001* | 1.9 (<0.001)* |
| **Embarrassing nature of the TCS**[b] | −0.24 | <0.001* | 0.8 (<0.001)* |
| **Enough time for the TCS**[b] | | 0.06 | |
| No | 7.5 ± 2.6 | | Reference |
| Yes | 9.1 ± 1.1 | | 1.7 (0.13) |
| **Obtaining all the answers to queries**[b] | | 0.04* | |
| No | 7.8 ± 2.4 | | Reference |
| Yes | 9.1 ± 1.1 | | 1.9 (0.04) |
| **Preference of a physical consultation**[b] | | <0.001* | |
| No | 9.4 ± 1.0 | | Reference |
| Without opinion | 9.1 ± 1.2 | | 0.9 (0.72) |
| Yes | 8.7 ± 1.4 | | 0.8 (0.02)* |

*Note*: Number of patients = 358.

Abbreviations: SD, standard deviation; TCS, telephone consultation.

[a]Linear regression model a with demographic data.

[b]Linear regression model b with evaluation of the teleconsultation data.

*$p < 0.05$.

if the patient reported embarrassment or preferred a physical consultation. Cognitive impairment was unfavorable to both satisfaction of the patient and efficiency of the teleconsultation. When the physician and the patient were asked if the teleconsultation replaced the physical consultation, they disagreed.

Effectiveness of telemedicine is well known in a number of areas, with a good satisfaction of patients.[2,8,9] In the specific field of neurology, telemedicine is associated with a high patient and physician satisfaction, and diagnostic accuracy is good.[4,10–12] Results are similar in older patients even with dementia.[13] To our knowledge, teleconsultation in neuro-urology had never been studied in adult population, but our results were consistent with those in neurology.

In 2020, Almathami et al.[8] reviewed barriers and facilitators that influence telemedicine. Outside technical factors related to the way of teleconsultation, some facilitators were reported as patient's training; motivation, privacy and familiarity with staff, and past experience. It should be noted that all the patients in our study had previously visited the department with an average of 11.4 prior visits. Need to family involvement during the teleconsultation increased barriers in telemedicine.[8] There is a lack of data regarding patient's characteristics associated with satisfaction or interest in telemedicine. In adult population, age did not influence the use or the satisfaction of telemedicine, travel distance to access to consultation was associated with an increasing interest in telemedicine.[8,14] In our study, travel distance between the patient's home and the department was not related to satisfaction. Important difference between travel distances in France and in the United States of America should explain this discordant finding. The influence of the level of disability and disease on the effectiveness and satisfaction of telemedicine stay unknown. In our study, when patients used a walking stick, physician rated a better efficacy of the teleconsultation. This result might represent the physicians' perception of the benefit of telemedicine for patients with physical disabilities. However, in patients with multiple sclerosis, the EDSS (Expanded Disability Status Scale) was not related to patient satisfaction or physician efficacy. Cognitive impairment was unfavorable to satisfaction of the patient and to the efficacy of the physician. However, in accordance to our result, patient and physician satisfaction remained high even in patients with cognitive impairments like dementia, multiple sclerosis, or movement disorders.[4,13,15–17]

In our study, when the physician and the patient were asked if the teleconsultation replaced the physical consultation, they disagreed. This agreement had never been studied, several studies reported preference of the patients for face-to-face consultation.[8,13,18] This underlined that face-to-face consultation may offered a social or psychological benefit in addition to purely medical questioning and thus, probably enhanced the treatment adherence.

In the context of COVID-19 pandemic, the assessment of the benefit-risk balance between the need to follow-up our neurologic patients and their vulnerability in front of the SARS-CoV-2 was a difficult issue. One part of this question is to measure the risk of COVID-19 in the neurologic population. Because of immunotherapies in multiple sclerosis, of the physic disabilities with insufficient respiratory like in tetraplegia or the older population in Parkinson disease, the risk of severe respiratory infection justified to encourage telemedicine in a context of infectious pandemic.[19–21] We are still waiting for the publish data of SARS-Cov2 infection in neurologic patients.

On the other hand, it is necessary to assess the risk for our patients to differ in their neuro-urologic care. Neuro-urologic risk is not well known. Two studies aimed to create a predictive score of neuro-urologic risk but without possibilities of clinical application.[22,23] Today, there is no recommendation on gradation of time to manage neurogenic bladder according to the degree of uro-nephrological risk.[24–28] In this context of difficult assessment of benefit-risk balance, teleconsultations might reassure patients about the continuation of their medical care and physicians about the health of their patients. As a consequence, it is possible that both patients and physicians overestimated the satisfaction of the telephone consultation.

Our study had several limits. First, teleconsultation were not performed with video tool. In telehealth, visual features enhance satisfaction with care for patients and are useful for communication and diagnosis for physicians.[8,29] However, in our study population, all the patients were already known of the department and neuro-perineal examination is rarely useful during the follow-up except in very specific cases (development of stress urinary incontinence in a woman, difficulty with self-catherization, recent genital prolapse secondary to abdominal pushing in voiding dysfunction due to cauda equina syndrome, ...). Otherwise, effectiveness of teleconsultation may be overrated for several reasons: First, included patients were chronic patients and already knew the physician, which might facilitate the teleconsultation. However, chronic patients represented the target population for telemedicine in neuro-urology, since physician needed physical examination for new patients. Second, the context of COVID-19 pandemic might overrate the satisfaction of the patient on the telephone consultation. To limit this bias, we asked patients to evaluate the satisfaction of being called by the physician and the satisfaction of the telephone consultation. We assumed that the satisfaction of being called was related to the endemic context. In accordance to this hypothesis, the correlation between satisfaction of being called and satisfaction of the telephone consultation was moderate. Another limitation to the interpretation of this

study was the possible measurement bias: patients were called by a study nurse from the neuro-urology department. To limit this bias, patients were informed that the collected data were anonymous. Finally, since it was a cross-sectional study, we could not determine if, after the telephone consultation, there were any adverse events because of misunderstandings in treatment indications or underdiagnosed conditions. Despite this, it is the first report of telemedicine in neuro-urology, with a high number of patients and an evaluation of the telephone consultation by patients and physicians.

## 5 | CONCLUSIONS

The use of telemedicine in neuro-urology was associated with a high satisfaction of the patients and is described as efficient by the physicians. The COVID-19 pandemic might be an opportunity to review and refine our practices in neuro-urology. In the future, some follow-up consultations might be replaced by teleconsultation to avoid transport to the hospital. An additional medico-economic study is needed to evaluate telemedicine in the field of neuro-urology.

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