

## Role of Video Documentation in Otolaryngology Practice

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**ABSTRACT: OBJECTIVE :** To analyse the effect of video documentation in ENT outdoor practice with regards to patient satisfaction. **STUDY DESIGN:** Retrospective Observational study. **SETTING:** ENT outpatient department of CMH Quetta from December 2011 to March 2012, and ENT department of CMH Multan from April 2012 to June 2012. **MATERIALS AND METHODS:** A standard micro-CCTV camera with optical coupler attached to rigid or fiberoptic endoscope and connected to USB TV device was used to record image of any pathology found on patient's ENT examination. Patients were shown recordings of their ENT pathology and were explained suggested treatment. After surgery, fresh recordings were taken. A set of questions was asked from the patients and results were deducted after assessment of the patient's response card. **RESULTS:** In the opinion of 67.5 % of patients, their understanding of the disease was complete after seeing the video. Interestingly out of those who consented for surgery, 42.5 % opined that they would have not consented for surgery so quickly if they had not been shown video evidence of their disease. 91.7 % said that serial videos made them more reassured about progress and current status of their disease. P value with Pearson Chi-Square test (used as test of significance) was less than .05, significantly in favour of greater reassurance level about progress of the disease after seeing video rather than without seeing video. **CONCLUSION:** Video documentation definitely increases patient's confidence, his understanding of disease, saves time and subsequent visits. It greatly adds to the patient's reassurance before and after surgery. .

**Key Words:** Video endoscopy, Video documentation, Photo documentation, Patient's satisfaction.

**INTRODUCTION:** The present era of rapid technological advancement has made its inroad into all walks of life and medical profession is no exception. Patients have become more aware of their disease and want much greater reassurances than were previously required. The advent of internet has transgressed continental boundaries and patients often seek opinion of doctors located thousands of miles away sitting on other side of globe. Use of video in ENT outdoor department has not only greatly enhanced the patient's understanding of his disease in much lesser time but also provides the information file to the patient that he can use to get expert opinion of anyone anywhere. Digital media has thus become standard documentation tools in modern ENT clinics<sup>1</sup>. Video / photographic documentation (using digital media) is far superior to words alone and has been termed photo-documentation<sup>2</sup>.

**MATERIALS AND METHODS: INCLUSION CRITERIA:** All patients with some video or photographically recordable ENT finding who reported to ENT outpatient department of CMH Quetta from December 2011 to March 2012, and ENT department of CMH Multan from April 2012 to June 2012 (As the first author moved from Quetta to Multan) were included in the study.

**EXCLUSION CRITERIA:** Patient's refusal to enter into the study. Patients reporting to ENT outpatient during the above period first underwent initial scrutiny by conventional ENT examination. The patients with positive ENT finding (perforation of drumhead, vocal nodules, growths or papillomas of larynx, nasal polypi,

angiofibroma or long standing inorganic foreign body nose) then underwent video or photographic recording of their finding. A standard micro-CCTV camera with optical coupler (total approximate cost Rs. 50,000) was used to make video of the finding after attaching it to appropriate endoscope 0° rigid endoscope for nasal and drumhead pathology, and 90° rigid laryngoscope / fibroptic nasolaryngoscope for laryngeal pathology). Recording was made on computer hard disc, while a simple USB TV device (approximate cost Rs. 1500) connected to laptop computer was used as recording device (see Fig 1 & 2). Patients were made to understand their disease by showing the recorded video. Patients were offered appropriate surgery (myringoplasty, microlaryngoscopy, nasal polypectomy or any surgery that may be required). They were

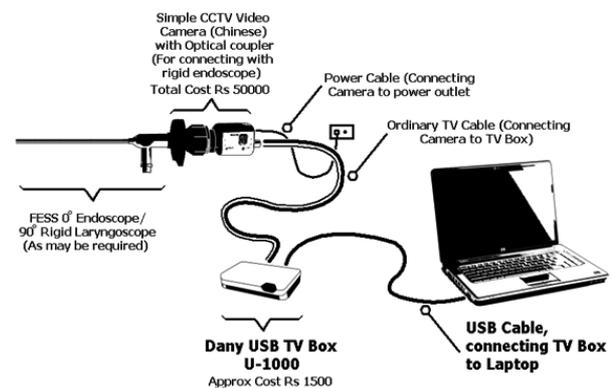


Figure 1 : Circuit diagram.



Figure 2 : A patient viewing his drumhead on laptop with the circuit described in Fig. 1

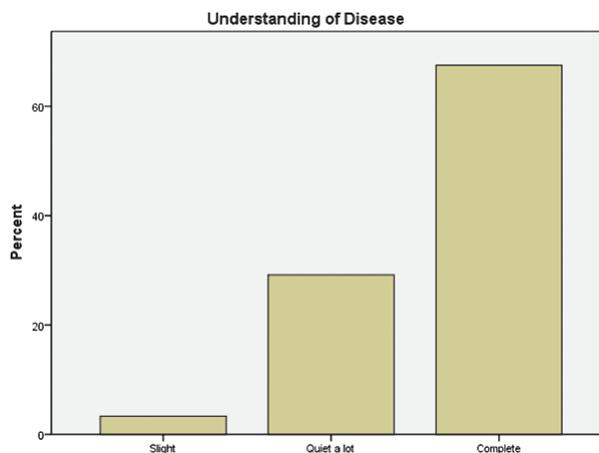


Chart 1 : Understanding level of disease in patients with video documentation.

| No. | Questions  | Yes         | May be     | No.         |
|-----|--|-------------|------------|-------------|
| 1.  | If you had been explained about the disease in detail but not shown the video, would your understanding level about the disease been still the same?     | 03 (2.5%)   | 40 (33.2%) | 77 (64.2%)  |
| 2.  | After showing the video, were you suggested surgery?   | 97 (80.8%)  | -          | 23 (19.2%)  |
| 3.  | Did you consent for the surgery?   | 82 (68.3%)  | -          | 38 (31.7%)  |
| 4.  | If your disease been explained in detail without showing the video, had you still consented to surgery?  | 30 (25.0%)  | 39 (32.5%) | 51 (42.5%)  |
| 5.  | Did you demand a fresh video about your disease to be made and shown again after the surgery?  | 87 (72.5%)  | -          | 33 (27.5%)  |
| 6.  | Did you feel the same amount of reassurance about the success of surgery after seeing the video which you would have felt even without seeing the video? | 09(7.5%)    | -          | 111 (92.5%) |
| 7.  | In your opinion do you think this video documentation made you feel more reassured about the serial progress of your disease?                            | 110 (91.7%) | -          | 10 (8.3%)   |

Table 1 : Analysis of patient response cards about the effect of video documentation

offered a copy of their video if desired. They were then given a proforma (consisting of seven questions) to fill. In case the patient consented for surgery, a sufficient time after surgery was given for wound to heal, after which many patients desired a new video to be made so as to get reassured that the pathology has been removed. After the video had been made they were again given proforma to fill. At the end of above period the record was analyzed and the observations made as shown in results. Pearson Chi-Square test was used to calculate statistical significance about weather the patient felt more reassured about progress of the disease after seeing video or without seeing video. p value was fixed as < .05 to be significant. RESULTS: A total of 120 consecutive patients with some photographically recordable finding were enrolled in this study with wide range of diseases of ear, nose or throat region. The results can be seen from the Table-1 given at the end. Their understanding level of disease with video documentation is graphically represented in Chart-1. Interestingly 64.2 % of patients thought that their understanding of the disease would not have been so complete if they had not been shown the video. After the video was shown, 80.8 % of patients were suggested surgery (this percentage is high because only the patients with some recordable ENT finding were subjected to video documentation). Out of those who were suggested surgery, 68.3 % consented for the

operation. Interestingly out of those who consented for surgery, 42.5 % opined that they would have not consented for surgery so quickly if they had not been shown video evidence of their disease. Out of those who underwent surgery, 72.5 % demanded a fresh post-surgery video, of which 92.5 % said that after seeing post-surgery video they felt more reassured about success of surgery. To the last question asked about serial progress of the disease, 91.7 % said that serial videos make them more reassured about progress and current status of their disease. P value with Pearson Chi-Square test came out to be .001, and being below .05 it was significantly in favour of greater reassurance level about the progress of disease after seeing video as compared to without it.

DISCUSSION: A simple and reasonably economical circuit for recording and making videos of ENT findings is shown in Fig 1 & 2. Making such video does not take more then 2 – 3 minutes, and saves a lot of time that may have otherwise been lost in educating and counselling the patient. In personal experience of the author, video documentation in ENT outpatient has the following advantages.

1. Real time video can be paused and then zoomed out at any stage, and very fine details of pathology (drumhead perforation, vocal or nasal pathology) analyzed. Digital video otoscopy is now an effective platform for tympanic membrane characterization.

- In addition, digital image enhancement and segmentation processing techniques can be applied to the acquired images, which could provide more visual detail and objective clinical interpretation<sup>3</sup>.
2. Provides greater understanding to the patients regarding the disease they are suffering from.
  3. Saves the time of Otolaryngologist and the patient by lessening the time required for patient's education and counseling.
  4. A printout of still images can be taken out and hard copy given to the patient or kept in patient's record file.
  5. Provides a video file to the patient which the patient can use for: (a) Getting opinion of distant otolaryngologist on internet. (b) Gauging the progress of his disease by comparing with serial videos. (c) Maintaining his own record file about the disease.
  6. Reassures the patient about success of surgery by showing post-op video.
  7. At times it may be used to remove patient's phobia about harboring a cancer of larynx or perforation of eardrum.
  8. Provides a reproducible record to clinician for subsequent clinical audit.
  9. Measurement of nasal airway obstruction can be performed with video endoscopic photo-documentation<sup>4</sup>.
  10. Video pneumatic otoscopy (VPO) is also useful for the diagnosis of conductive hearing loss (CHL) with normal tympanic membranes (TM). This is done by capturing TM images in 3 stages of the VPO (static, positive, and negative pressure stage) and measuring the amount of relative position differences of the umbo. In one study, the results in diagnosing Stapedial fixation and Ossicular discontinuity were comparable to that with Temporal Bone Computer Tomography (TBCT)<sup>5</sup>.
  11. Its value as a teaching aid for anatomy, physiology, pathology of ENT region, and its role for understanding endoscopic surgeries is now well established. Videography is the most practical and effective method of documenting and teaching ENT endoscopy<sup>6</sup>.
  12. Its usefulness has now extended much beyond ENT frontiers including anaesthesia. Video laryngoscopy (VL) has been shown to improve first attempt success compared to direct laryngoscopy (DL) in many clinical settings<sup>7</sup>.
- A software program has been developed that allows the creation and administration of digital pictures and videos using only one program. Filing is done automatically<sup>8</sup>. Video documentation of clinical record is a subject that has now generated quiet an interest among the clinicians for number of reasons. In the field of ENT, it was first used in Japan in 1954. Its use was limited initially for documentation, understanding and patient's education of vocal fold movement, and hence called video stroboscopy. It was then taken up by ENT's closest neighbor i.e. the dentist, this time the reason was to document serial progress

of the maloccluded teeth to orthodontic treatment<sup>9</sup>. Due to the advantages of this meticulous record keeping its use has now extended to involve other specialties. Considering the overwhelming advantages of video and photographic documentation of ENT pathologies, its use in ENT outdoor is certainly very beneficial both for the patient and clinician. However a limiting factor is the very high cost of video recording equipment coupled with extremely expensive endoscopes particularly those of branded companies. Numerous improvisations have been suggested to overcome this 'cost barrier'. In one study a digital camera (Nikon Coolpix 950 and Coolpix 990) was placed in contact with Zeiss and Leica microscope's one ocular lens<sup>10</sup>. However this technique recorded only microscopic image. In another study, endoscopic images were monitored by attaching a flexible or rigid endoscope to a camera by special adapter screws onto the lens top<sup>11</sup>. In yet another improvised modification a VMS-001 USB Microscope (a webcam designed for higher magnification) was attached to endoscope using a disposable camera head drape<sup>12</sup>. In another technique for video recording of ENT pathologies, a JVC GX-N8U color video camera was connected to Hopkins endoscope using a Karl Storz quick connect adapter. This improvisation was however expensive<sup>13</sup>. In a slightly different technique, Barr GD suggested a low cost improvisation. A Nikon Coolpix 4600 4 megapixel camera was attached to endoscope using modified blue bottle top of mineral water bottle as a connector / adapter<sup>14</sup>. Now coming to the printout of videos and still images of ENT pathologies, a study suggested that the pictures produced by the color video printers (Sony UP 5000 & Sony CVP G500) were of unexpectedly high quality and compared very favorably with those produced by conventional color film photography in color, image sharpness and resolution. The video printouts made with the recorder on 'pause' mode produced unwanted electronic horizontal lines either on the top or bottom of the printouts. This could be avoided by making the print of the desired image while the videotape was running<sup>15</sup>. The circuit used to record ENT pathologies in our study may not produce very high resolution pictures, but it certainly has the advantage of being extremely cheap and therefore easily accessible and affordable in countries like Pakistan with low income economy. The picture quality is reasonable enough for clear visualization and documentation of any ENT pathology, both for clinician and patient. Moreover the study shows that the level of patient satisfaction is much greater with this form of documentary evidence.

**CONCLUSION:** Video documentation in ENT outdoor practice definitely increases the patient's confidence, his understanding of the disease, saves the patient's time and subsequent visits and greatly adds to patient's reassurance before and after surgery. Moreover new locally improvised techniques have overcome the 'cost barrier'. Apart from its professional and academic advantages, cost effective equipment for video documentation of ENT pathologies also enormously

enhances the general image and reputation of ENT department in any setup.

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