HDTV NBI

CASE STUDY of HD-NBI

UROLOGY

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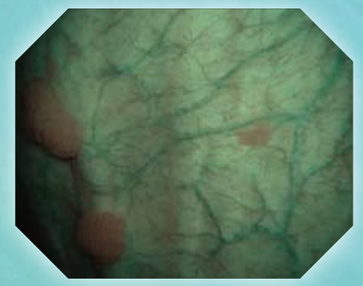

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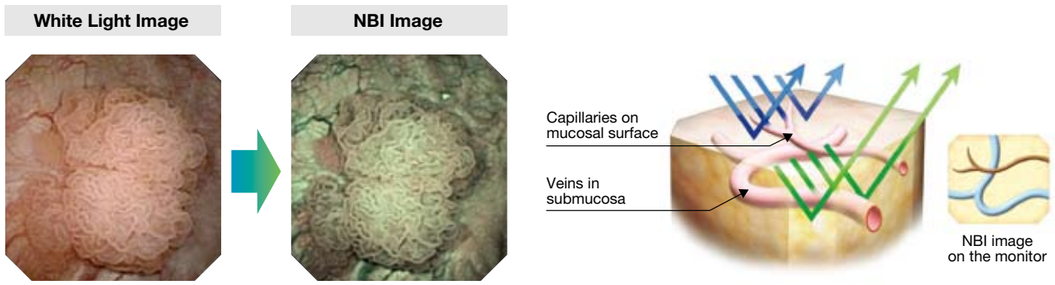
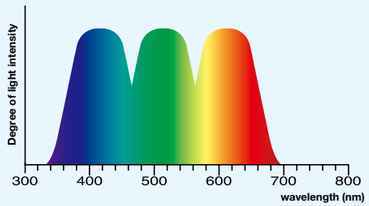
Narrow Band Imaging

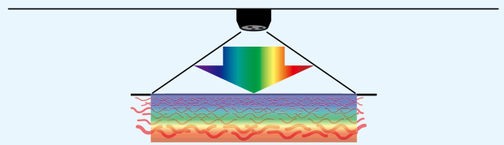
NBI is an optical image enhancement technology that enhances the visibility of vessels and other tissue on the mucosal surface. Narrowband illumination, which is strongly absorbed by hemoglobin and penetrates only the surface of tissues, is ideal for enhancing the contrast between the two. As a result, under narrowband illumination, capillaries on the mucosal surface are displayed in brown on the monitor, and veins in the submucosa are displayed in cyan.



Conventional White Light

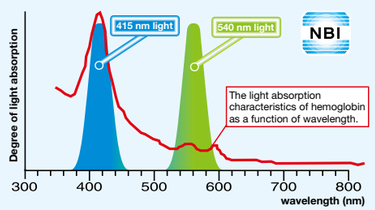


White light is composed of an equal mixture of RGB wavelengths.

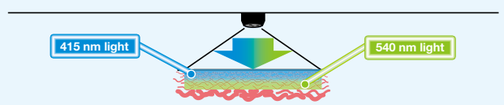


Short wavelengths have shallow penetration characteristics whereas long wavelengths penetrate deeper into the mucosa.

NBI (Narrow Band Imaging)



The narrowband light is composed of two specific bands that are strongly absorbed by hemoglobin.



Short wavelengths penetrate only the superficial layers of the mucosa.
→ Absorbed by capillary vessels in the surface layer of mucosa.

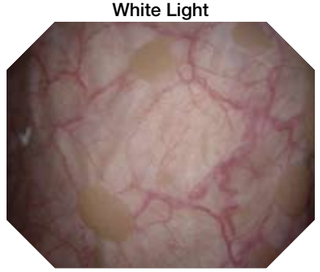
Longer wavelengths penetrate deeper compared to 415 nm light.
→ Absorbed by blood vessels such as veins, which are located deeper than capillary vessels in the surface layer of the mucosa.

INDEX

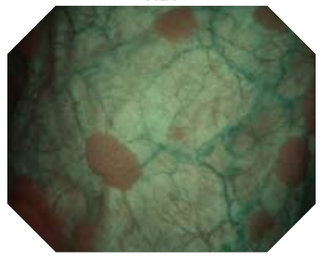
Junichi Inokuchi, MD. Katsunori Tatsugami, MD.

Papillary peduncular tumor/Sessile tumor — age 80, female

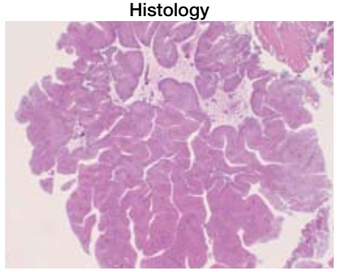
White Light



NBI



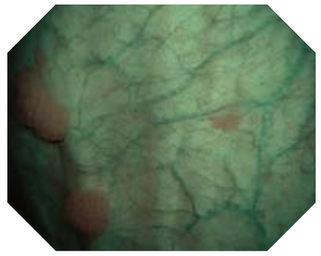
Histology



UC, pTa, Low grade(G2)

White Light

NBI

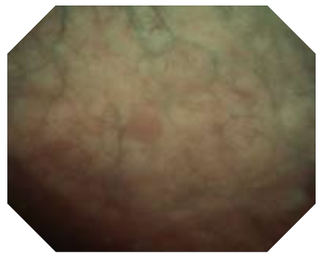


Comments
A small tumor is highlighted under NBI which was suspected under WLI.

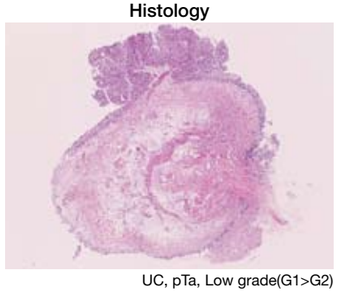
Papillary peduncular tumor — age 61, male

White Light

NBI



Histology



UC, pTa, Low grade(G1>G2)

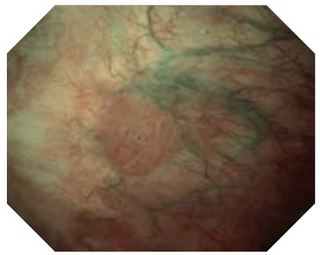
Comments
Utilizing NBI enables us to enhance visualization of the marginal region of the tumor.

Prof. Seiji Naito, MD.
Kyushu University, Japan

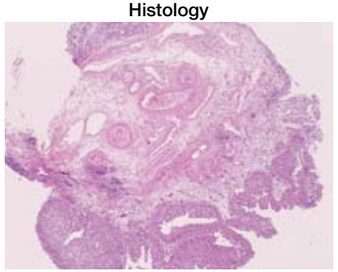
Papillary peduncular tumor — age 82, male

White Light

NBI



Histology



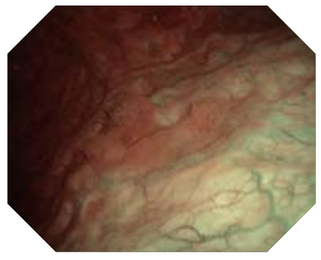
UC, pTa, Low grade(G2)

Comments
Utilizing NBI enabled us to visualize a marginal region of small tumors which were difficult to visualize under WLI.

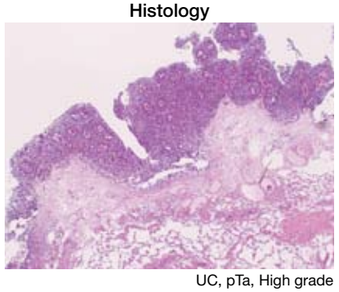
Papillary sessile tumor — age 82, female

White Light

NBI



Histology



UC, pTa, High grade

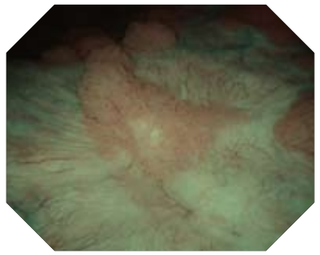
Comments
Utilizing NBI enabled us to enhance visualization of the marginal region of the tumor. Also NBI enabled us to identify surrounding small tumors which were difficult to identify under WLI.

Images and comments by ***Junichi Inokuchi, MD. Katsunori Tatsugami, MD. Prof. Seiji Naito, MD.***

Papillary peduncular tumor/Sessile tumor — age 80, female

White Light

NBI



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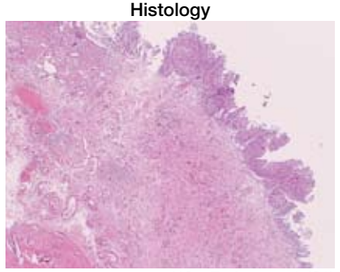
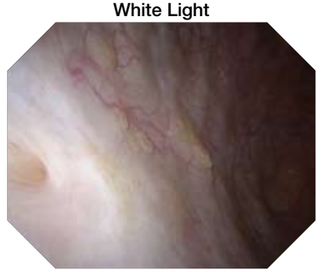
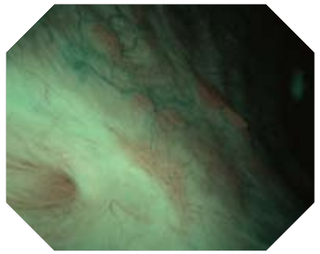


UC, pTa, Low grade(G2)

White Light

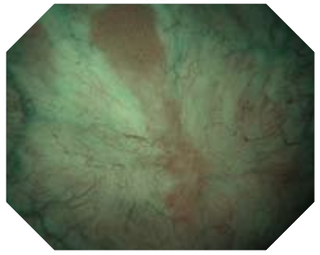


NBI

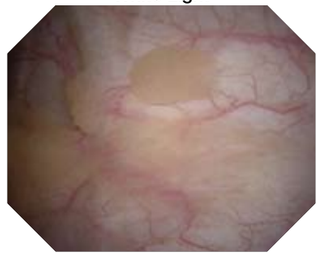


White Light

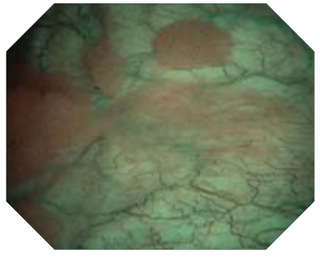
NBI



White Light



NBI

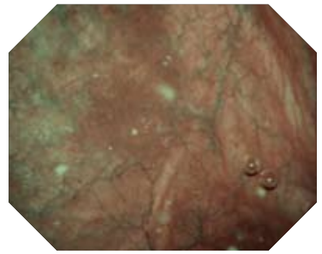


Comments
Reccurent tumor which occurs more often in bladder. Utilizing NBI enabled us to enhance visualization of marginal regions of the tumor.

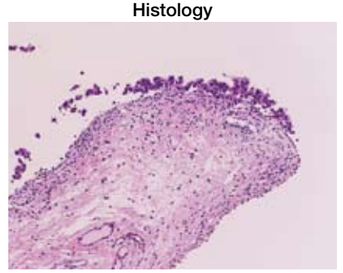
Rubor mucosa — age 81, male

White Light

NBI



Histology

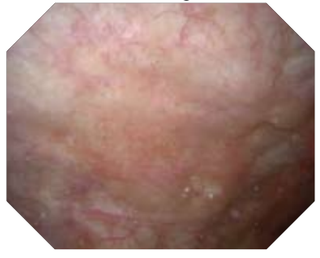


UC, CIS

Comments
Bladder CIS. Utilizing NBI enabled us to enhance visualization of marginal region.

Rubor mucosa — age 81, male

White Light



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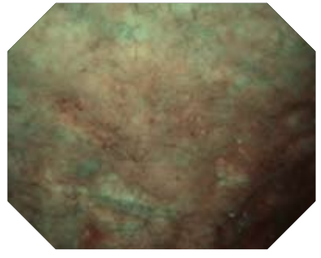
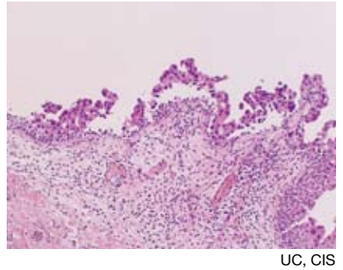


Histology



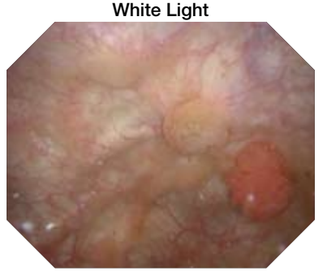
UC, CIS

Comments
The case suspected carcinoma in situ and identified rubor bladder mucosa. Histopathologic examination revealed CIS.

Images and comments by ***Junichi Inokuchi, MD. Katsunori Tatsugami, MD. Prof. Seiji Naito, MD.***

Papillary peduncular tumor/Sessile tumor + rubor — age 81, male

White Light



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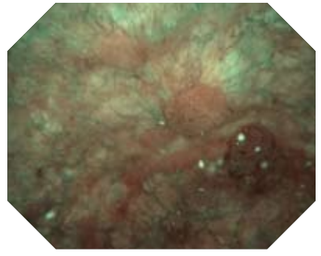
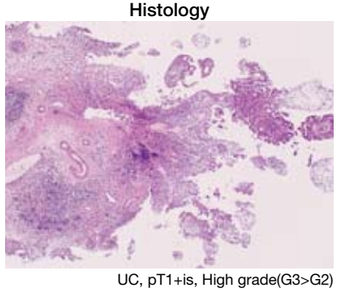


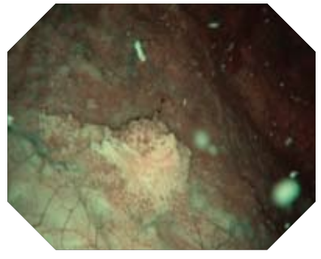
Histology



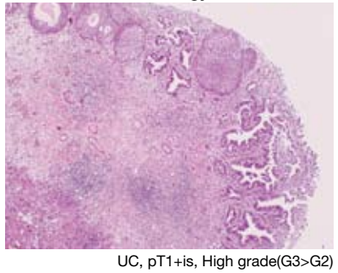
UC, pT1+is, High grade(G3>G2)

White Light

NBI



Histology



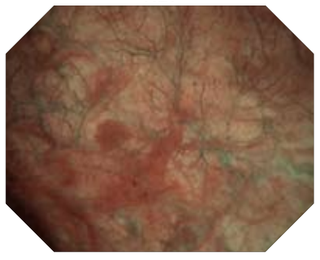
UC, pT1+is, High grade(G3>G2)

Comments
Utilizing NBI enabled us to visualize a papillary tumor and surrounding abberant mucosa more definitely. Histopathologic examination revealed T1+is.

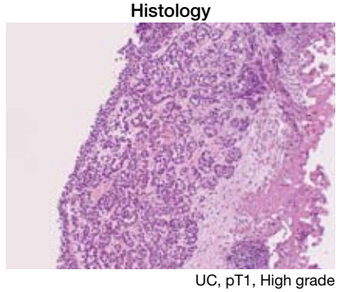
Nodular sessile tumor — age 82, female

White Light

NBI



Histology

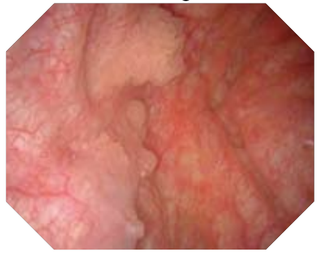


UC, pT1, High grade

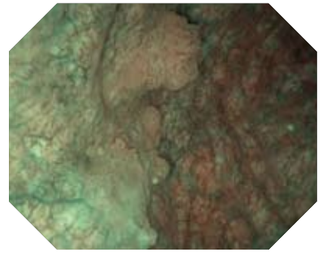
Comments
Short tumor which visualization of marginal region was unclear under WLI. Histopathologic examination of resected specimen revealed pT1.

Papillary peduncular tumor/Sessile tumor — age 84, male

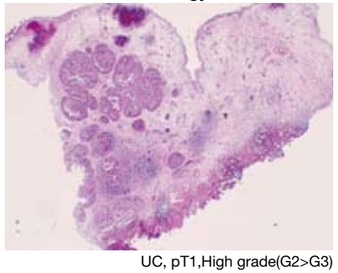
White Light



NBI



Histology

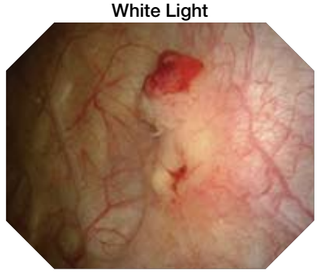


UC, pT1,High grade(G2>G3)

Comments
In this case the TUR specimen was T1, high grade. Utilizing NBI enabled us to enhance visualization of marginal region.

Nodular sessile tumor — age 78, male

White Light



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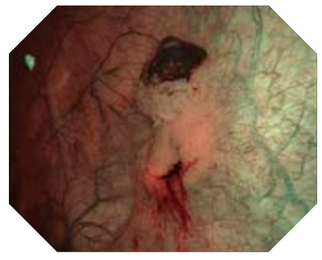
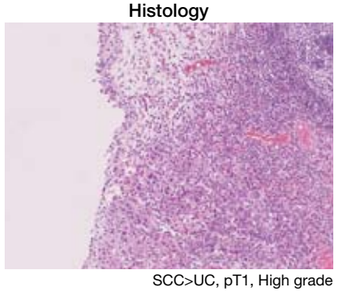


Histology



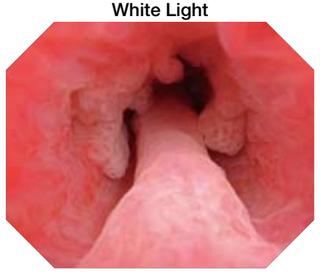
SCC>UC, pT1, High grade

Comments
Nodular tumor with partial ulceration. Utilizing NBI enabled us to enhance visualization of marginal region.

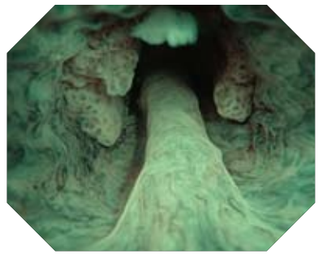
Images and comments by ***Junichi Inokuchi, MD. Katsunori Tatsugami, MD. Prof. Seiji Naito, MD.***

Papillary sessile tumor — age 87, male

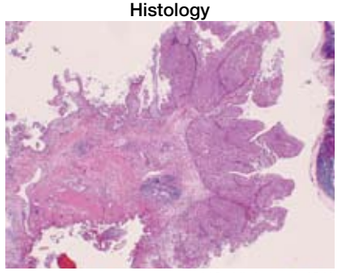
White Light



NBI

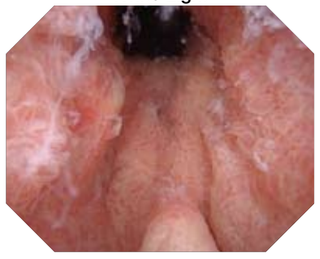


Histology

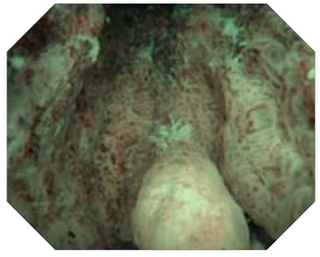


UC, High grade(G3)

White Light



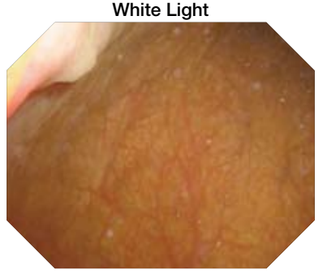
NBI



Comments
Advance to prostatic part of urethra of invasive bladder cancer. Low grade papillary tumor. Nodular tumor.

Papillary sessile tumor — age 61, male

White Light



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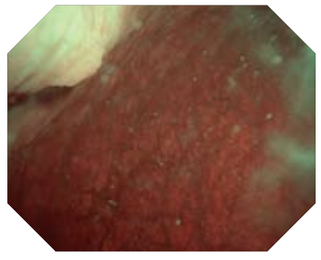


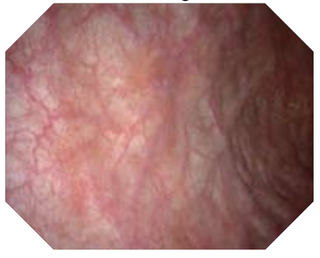
Histology

No malignant tissue

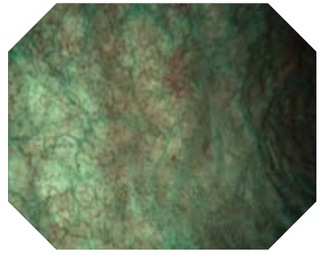
Comments
Papillary change on front side wall near bladder neck. Not malignant by biopsy.

Right side wall rubor — age 84, male

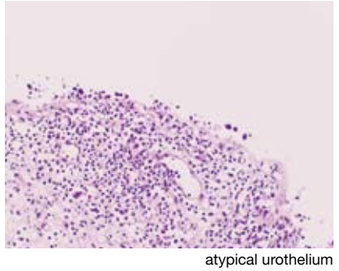
White Light



NBI



Histology

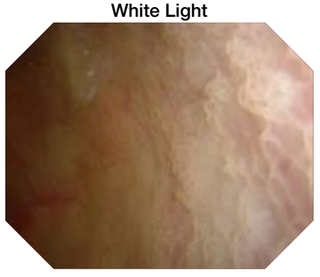


atypical urothelium

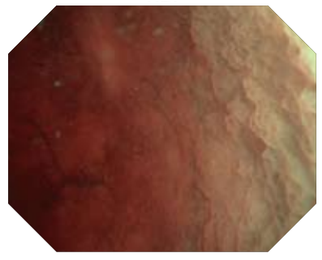
Comments
Minor rubor on side wall.

Velutinous mucosa — age 82, male

White Light



NBI



Histology

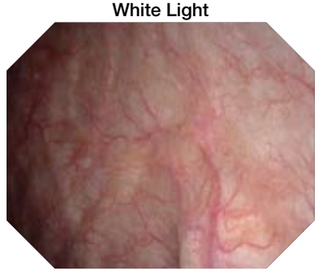
dyspalastic urothelium

Comments
Velutinous mucosa biopsy.

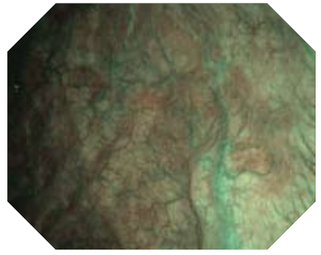
Images and comments by ***Junichi Inokuchi, MD. Katsunori Tatsugami, MD. Prof. Seiji Naito, MD.***

Abnormal mucosa — age 84, male

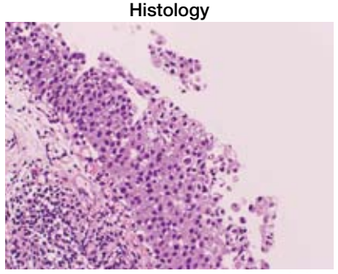
White Light



NBI



Histology

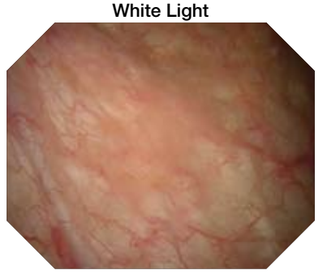


dysplastic urothelium

Comments
Abnormal mucosa on exterior left uretero orifice biopsy.

Minor vessel focusing — age 82, male

White Light



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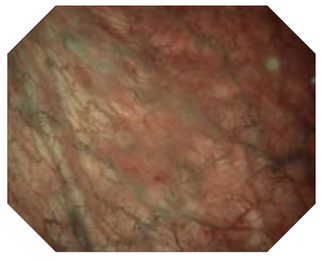


Histology

No malignant tissue

Comments
Minor abnormal vessel focusing.

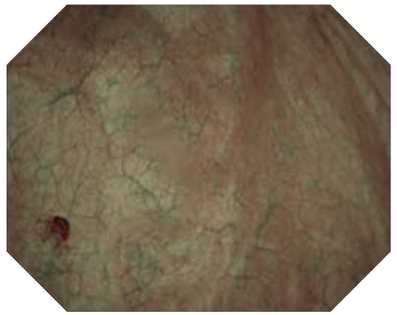
Images and comments by ***Junichi Inokuchi, MD. Katsunori Tatsugami, MD. Prof. Seiji Naito, MD.***

Multiple papillary tumors

age 74, male

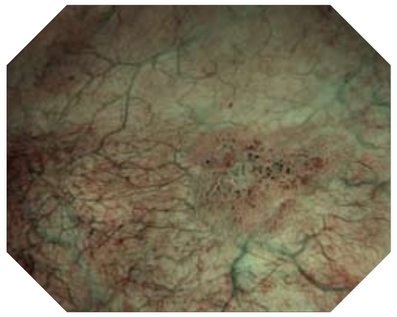
White Light

NBI

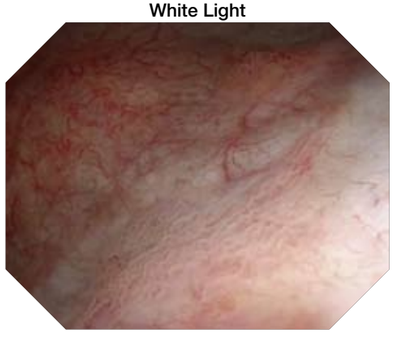


White Light

NBI



White Light



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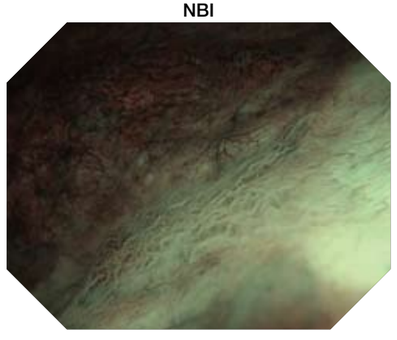
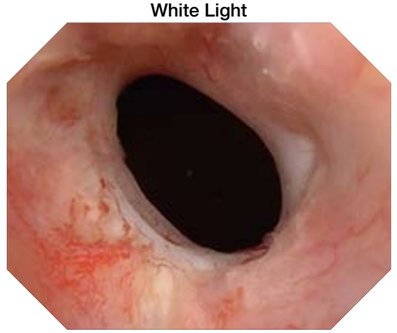


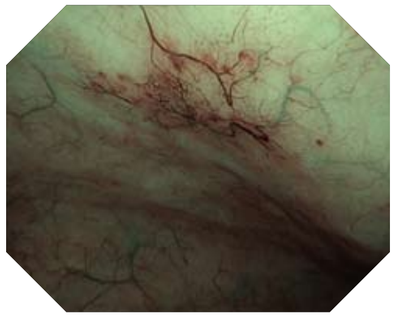
White Light



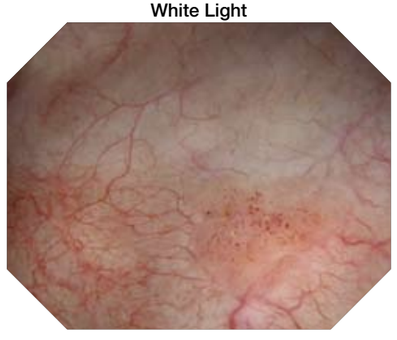
NBI

White Light

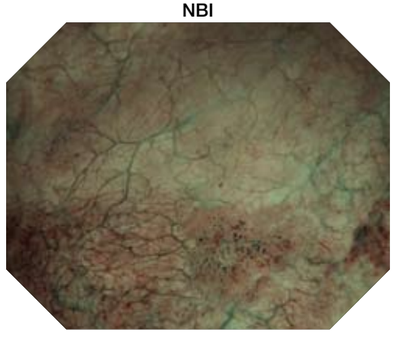
NBI



White Light



NBI



Comments

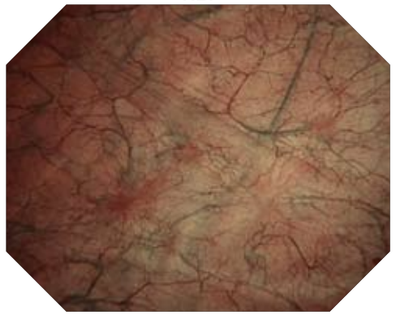
Multiple papillary lesions, especially on the bladder trigone, posterior and anterior wall were visible with WLI. After NBI-enhancement, additional multiple papillary fields were visualized. Histology showed pTa, Low grade (G1).

Images and comments by ***Prof. Jean de la Rosette, MD.***

Multiple papillary tumors — age 88, male

White Light

NBI

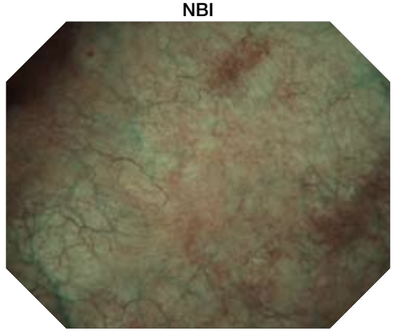


Comments
Multiple papillary lesions, especially on the left bladder wall and behind the right ostium, clearly visible after NBI-enhancement. Histology showed pTa, Low grade (G1).

Congestive mucosa of the bladder's trigone — age 28, female

White Light

NBI

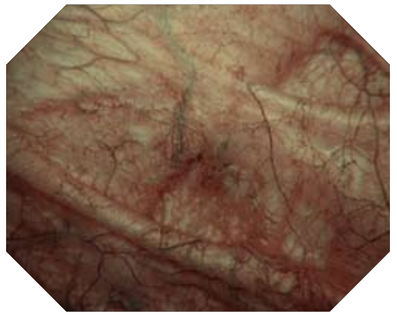


Comments
Congestive mucosa of the bladder trigone. NBI enhances the hypervascularized area. Histology showed pTa, Low grade (G2).

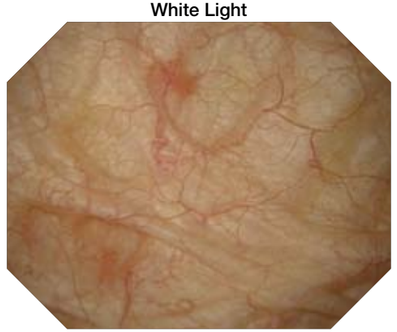
Flat Lesion — age 69, male

White Light

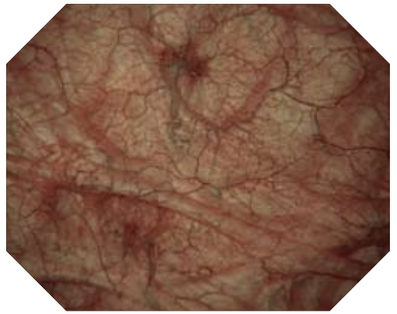
NBI



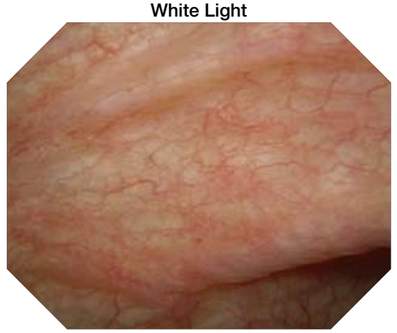
White Light



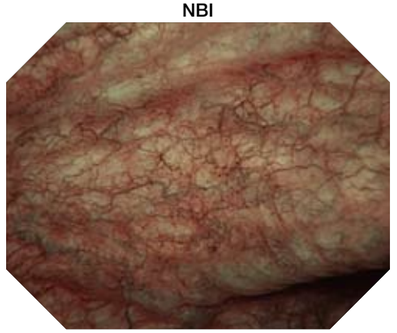
NBI



White Light



NBI



Comments
Suspicious superficial lesions adjacent to the right ostium, visible after NBI-enhancement. Histology showed pTa, Low grade (G2).

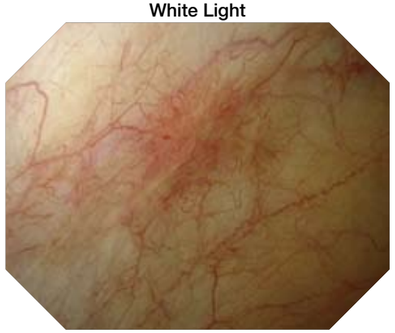
Images and comments by ***Prof. Jean de la Rosette, MD.***

Angelo Naselli, MD. Prof. Paolo Puppo, MD.

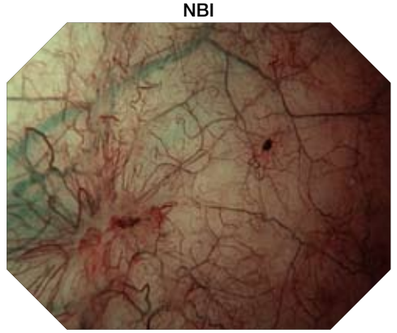
Oncological Urology, Istituto Clinico Humanitas Mater Domini, Castellanza, Varese, Italy

Relapse Bladder Cancer — age 73, male

White Light



NBI

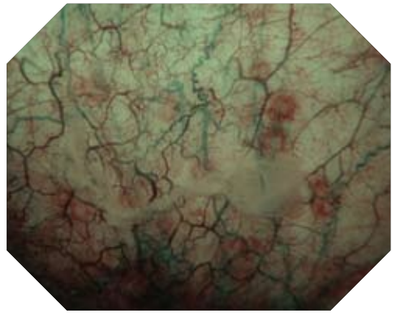


Comments
A flat tumor evidenced by NBI which was seen as a scar in WLI. Histology showed pTa, High grade.

Relapse Bladder Cancer — age 71, male

White Light

NBI

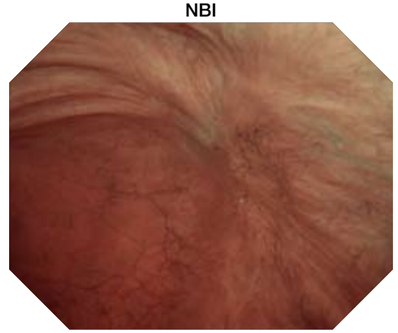


Comments
A low grade recurrence which was missed in WLI after BCG topic therapy. Histology showed pTa, Low grade.

Relapse Bladder Cancer — age 48, male

White Light

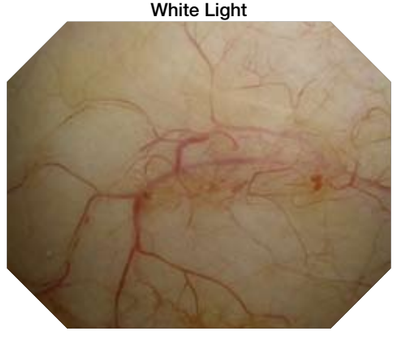
NBI



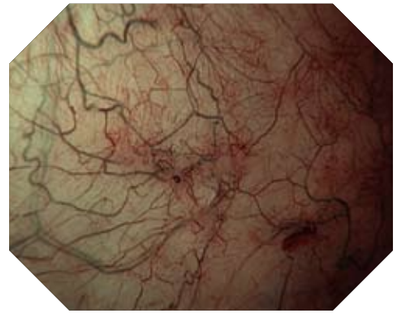
Comments
A high grade recurrence which was missed in WLI (no adjuvant instillation). Histology showed pTa, High grade.

Relapse Bladder Cancer — age 73, male

White Light



NBI

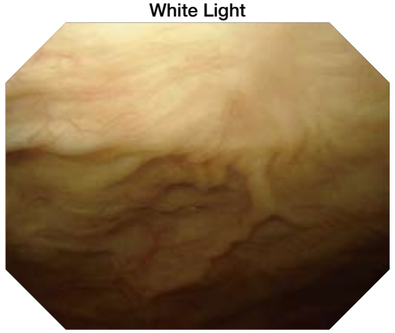


Comments
A recurrence which was missed in WLI. Histology showed pTa, Low grade.

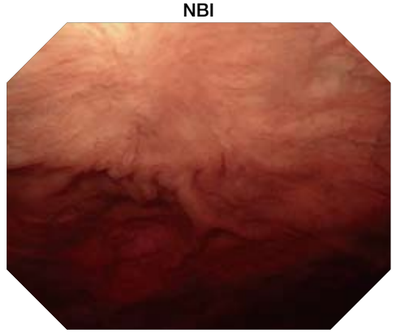
Images and comments by ***Angelo Naselli, MD. Prof. Paolo Puppo, MD.***

Relapse Bladder Cancer — age 64, male

White Light



NBI

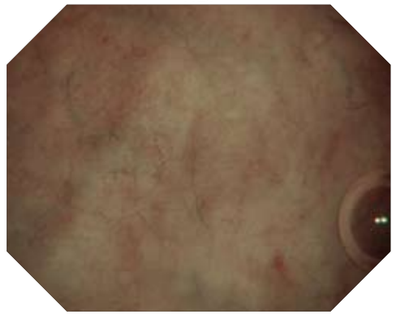


Comments
A high grade recurrence which was missed in WLI after BCG topic therapy. Histology showed pTa, High grade.

Flat Lesion — age 53, female

White Light

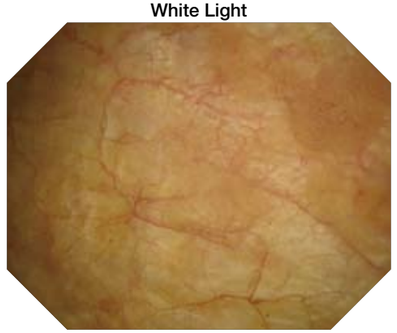
NBI



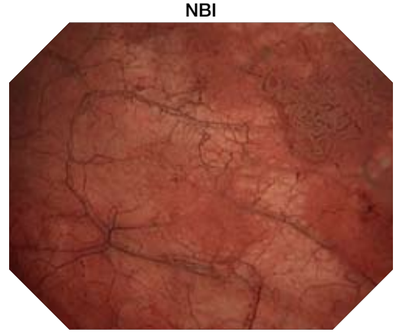
Comments
Patient with positive urine cytology and negative standard WLI cystoscopy (history of high grade non invasive bladder cancer). The red areas evidenced by NBI were then biopsied and CIS was found. Histology showed CIS.

Papillary peduncular Tumor — age 67, male

White Light



NBI

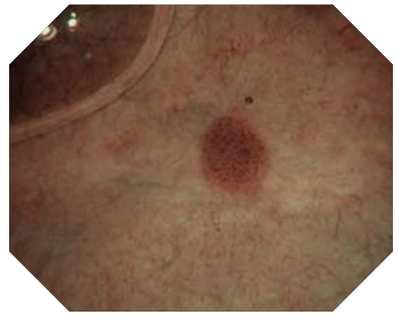


Comments
An area of micro-papillary tumor was completely missed by WLI, but was enhanced with NBI, with the vascular cores of the papillary structure showing a characteristic "speckled appearance. Histology showed pTa, Low grade.

Papillary sessile tumor — age 80, female

White Light

NBI



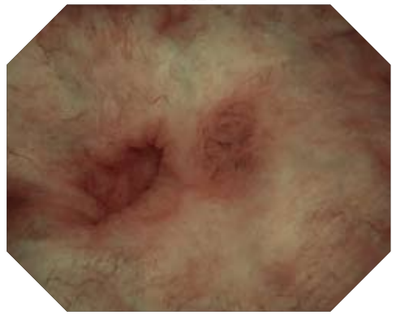
Comments
Micro Papillary Flat Tumor. An area of tumor was shown as a "red patch" by WLI but was enhanced with NBI in patient submitted to BCG topic therapy. Histology showed pTa, High grade.

Images and comments by ***Angelo Naselli, MD. Prof. Paolo Puppo, MD.***

Papillary sessile tumor — age 57, male

White Light

NBI



Comments
Early papillary tumor. A recurrence which was overlooked under WLI inspection and was enhanced by NBI.
Histology showed pTa, Low grade.

Images and comments by ***Angelo Naselli, MD. Prof. Paolo Puppo, MD.***

Memo