International Anal Neoplasia Society

IANS 9TH SCIENTIFIC MEETING
LONDON
June 6-8, 2025

CLINICAL ASPECT OF TRANSPLANTS

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DISCLOSURES

- Advisory board meeting 19.03.2024 MSD Denmark

LEARNING OBJECTIVES

Organ transplant recipients, here represented by kidney transplant recipients, from a Danish perspective, and their risk of:

Anal hrHPV infection and for female KTRs cervical co-infection
Anal warts
Anal HSIL
Perspectives for anal cancer screening in this population

BACKGROUND

IN DENMARK THERE IS NO SCREENING PROGRAM FOR ANAL CANCER, AND THIS IS REFLECTED IN LOWER RATES OF ANAL HSIL AND HIGHER RATES OF ANAL CANCER

1998 – 2018:

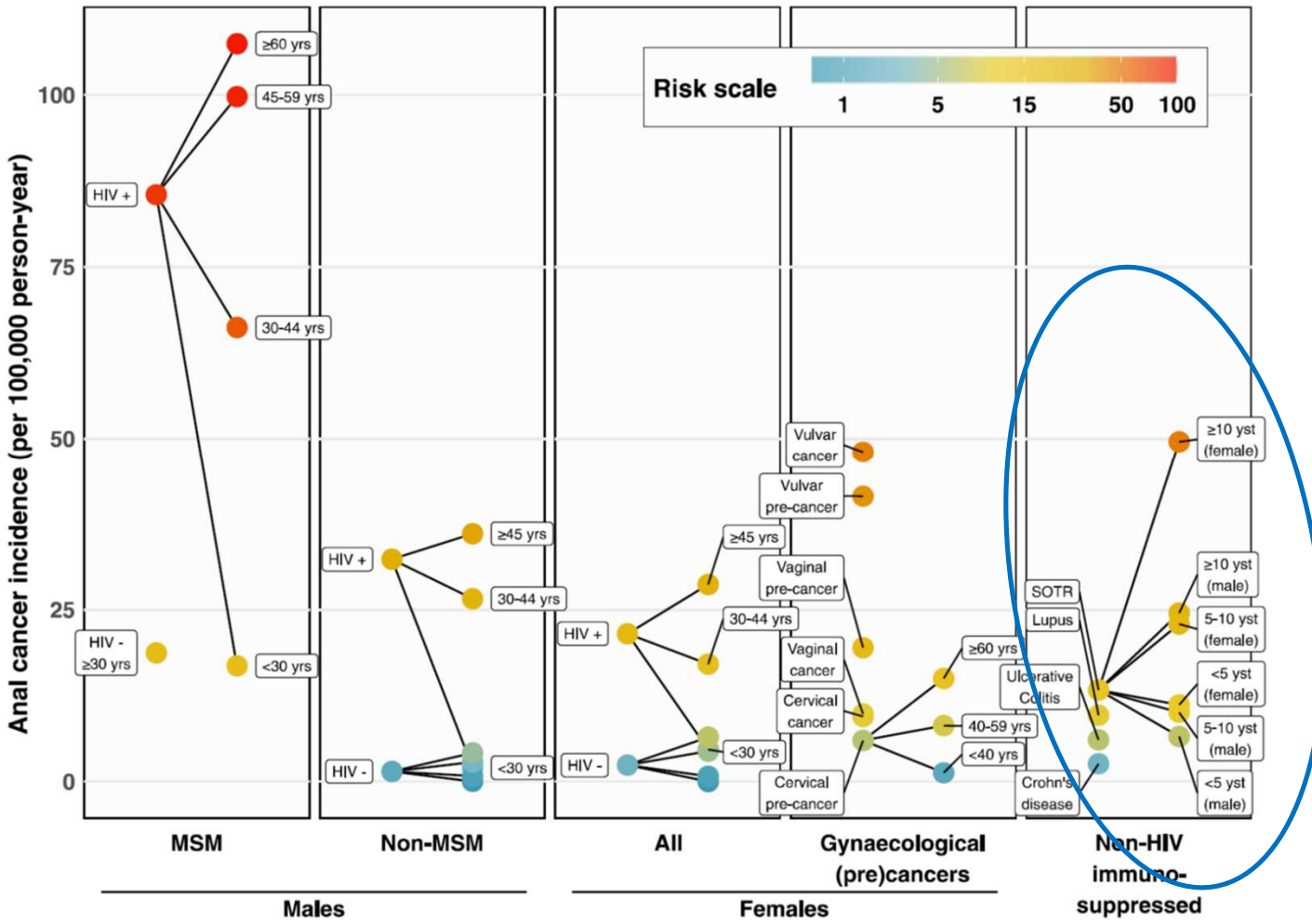
2580 anal cancer (90% SCC)	**871 aHSIL-AIN2/3**

2/3 of anal SCC and aHSIL-AIN2/3 were among women

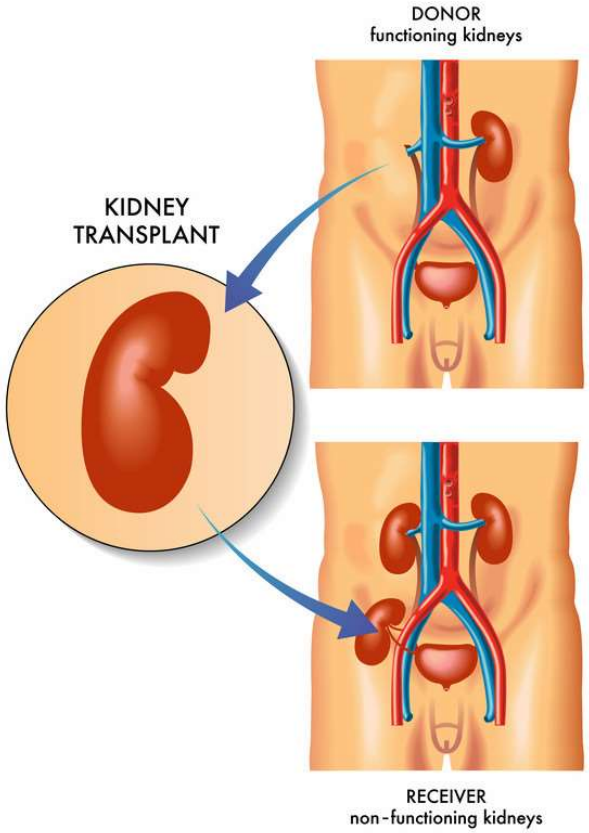
AIN: Anal intraepithelial neoplasia
aHSIL: anal high grade squamous intraepithelial lesion

Ref.: Urbute A et al. Trends in incidence and survival from anal cancer and incidence of high-grade anal intraepithelial neoplasia in Denmark. Cancer Epidemiol. 2022 Apr;77:102099

REF.:
CLIFFORD G ET AL. A META-ANALYSIS OF ANAL CANCER INCIDENCE BY RISK GROUP: TOWARD A UNIFIED ANAL CANCER RISK SCALE. INT J CANCER. 2021;148(1):38-47.



BACKGROUND



Induction therapy

Interleukin II inhibitor **or** T-lymphocyte–depleting agent

Maintenance therapy

Tacrolimus or Ciclosporin or Sirolimus **and** Mycophenolate or (Azathioprin) **and** Prednisolone

Impaired host T-cell response on the clearance or control of an established HPV infection

Project overview

Registry-based study

Kidney transplant recipients

Risk of genital warts

Risk of cervical-, vulvar-, vaginal-, penile- and anal precancerous lesions and cancer

Clinical study

Prevalence and risk of anogenital warts

Prevalence and risk of anal HPV infection

Prevalence and risk of anal HSIL

Prevalence of cervical HPV infection and risk of anal co-infektion

Incidence and clearance of cervical and anal HPV infection

Prevalence of oral HPV infection

Prevalence of penile HPV infection

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Received: 18 April 2018 | Revised: 8 July 2018 | Accepted: 25 July 2018

DOI: 10.1111/ajt.15056

ORIGINAL ARTICLE

AJT

Risk of genital warts in renal transplant recipients—A registry-based, prospective cohort study

Helle Kiellberg Larsen[1,2] | Louise T. Thomsen[1] | Merete Haedersdal[2] | Christian Dehlendorff[3] | Søren Schwartz Sørensen[4] | Susanne K. Kjaer[1,5]

Received: 10 August 2018 | Accepted: 23 August 2018

DOI: 10.1111/ajt.15108

EDITORIAL

AJT

Time to take on HPV in transplant clinic—Warts and all

RESULTS (REGISTRY-BASED STUDY)
LARSEN HK ET AL. *AMERICAN JOURNAL OF TRANSPLANTATION*. 2019;19(1):156-165

- 62% were men
- 66% were aged ≥40 years at baseline
- qHPV vaccine before baseline
- History of HPV-related anogenital (pre-)cancer lesions
- HIV-infection

→ KTRs = non-KTRs

1.2% vs 1.1%

2.4% vs 2.2%

0.2% vs 0.1%

- Other solid organ transplantations → 1.7% of KTRs compared with <0.1% of non-KTRs

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TABLE 2 Hazard ratio of genital warts in Danish renal transplant recipients (RTRs) 1996-2015 vs a nontransplanted control cohort (non-RTRs), overall and stratified by sex

	Person-y at risk	Number of GW episodes	HR[a]	95% CI	HR[b]	95% CI
Both sexes						
Non-RTRs	1 377 972	2025	1	Ref	1	Ref
RTRs	23 926	132	3.41	2.86-4.06	3.30	2.76-3.93
Women						
Non-RTRs	522 262	654	1	Ref	1	Ref
RTRs	9043	60	4.94	(3.79-6.43)	4.70	3.61-6.13
Men						
Non-RTRs	855 711	1371	1	Ref	1	Ref
RTRs	14 883	72	2.70	2.13-3.43	2.63	2.07-3.33

CI, confidence interval; GW, genital warts; HR, hazard ratio; RTR, renal transplant recipient.
[a]Adjusted for age at baseline and sex.
[b]Adjusted for age at baseline, sex, education, and income.

- HRs of AGWs were increased in RTRs compared with non-RTRs
  - <1 year of transplanation throughout follow-up (≥ 10 years)
  - Independent of year of transplantation
  - In all age groups at transplantation

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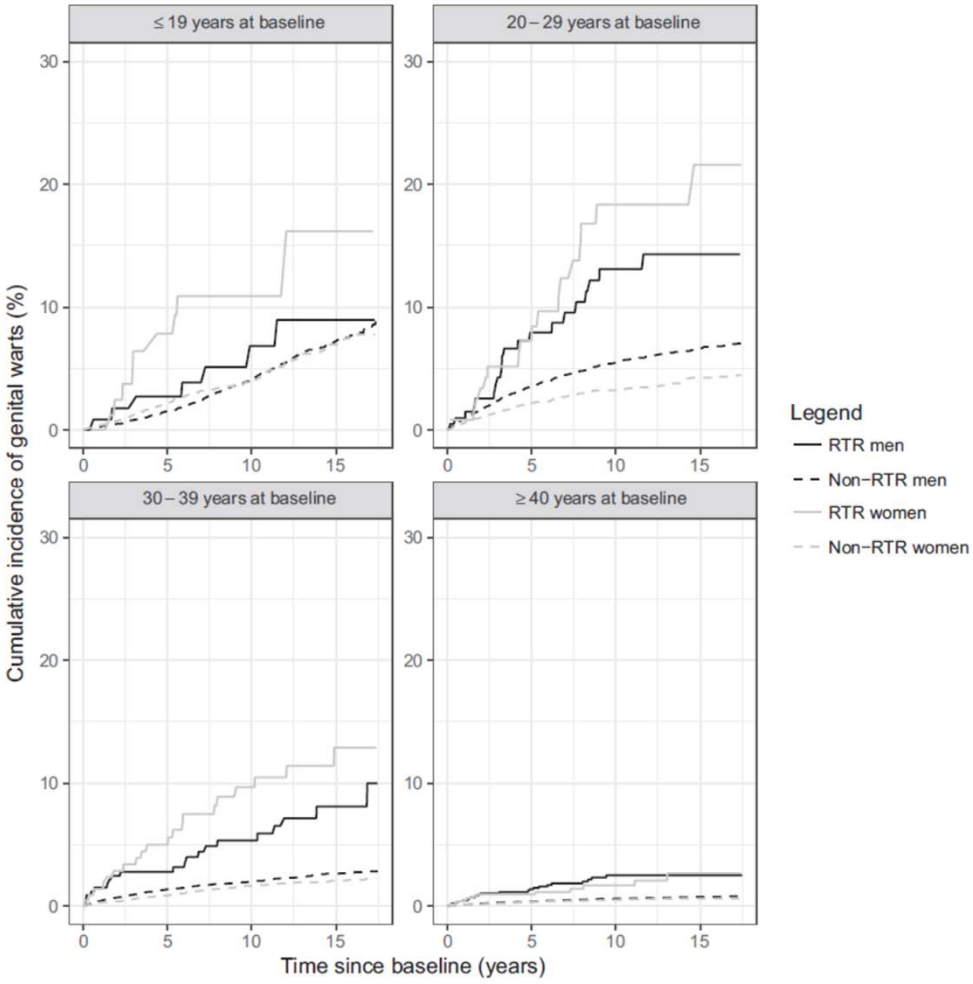


› Acta Derm Venereol. 2021 Jul 13;101(7):adv00497. doi: 10.2340/00015555-3858.

Risk of Anogenital Warts in Renal Transplant Recipients Compared with Immunocompetent Controls: A Cross-sectional Clinical Study

Helle K Larsen [1], Louise T Thomsen, Merete Hædersdal, Trine Thorborg Lok, Jesper Melchior Hansen, Søren Schwartz Sørensen, Susanne K Kjær

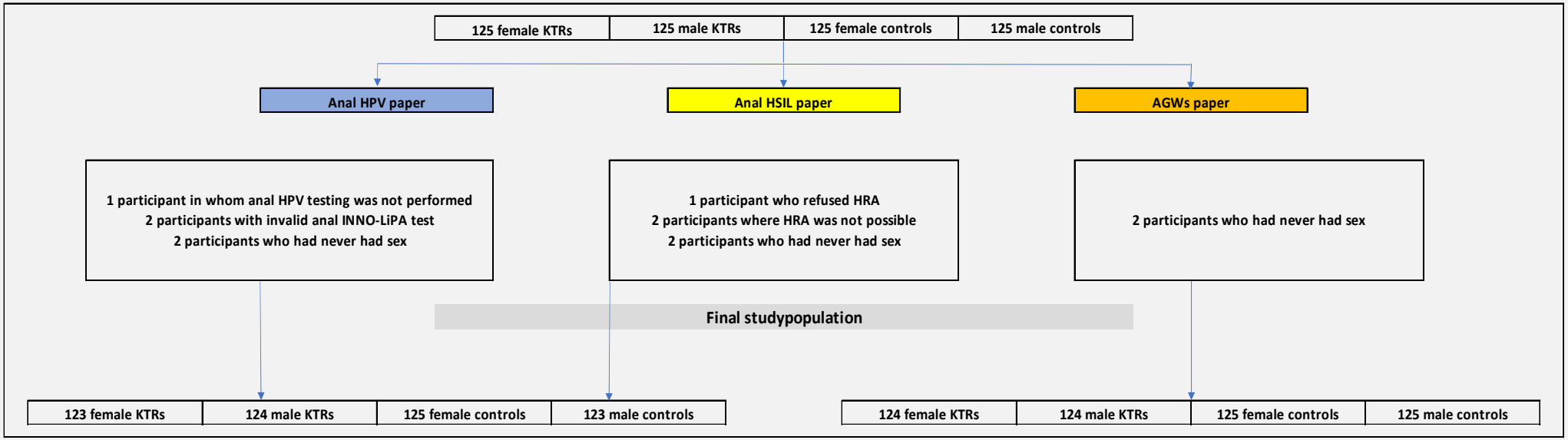
Recruitment:

KTRs: 5 departments of Nephrology and Department of Dermato-venereology, Bispebjerg Hospital

Controls: Department of Dermato-venereology, Bispebjerg Hospital, capillary disorders (laser), skin (pre-)cancer screening

Inclusion criterias:

- HIV uninfected
- ≥18 years of age
- no prior HPV vaccination
- no known condition requiring immunosuppressive treatment (other than the kidney transplant)
- KTRs at least 6 months posttransplant



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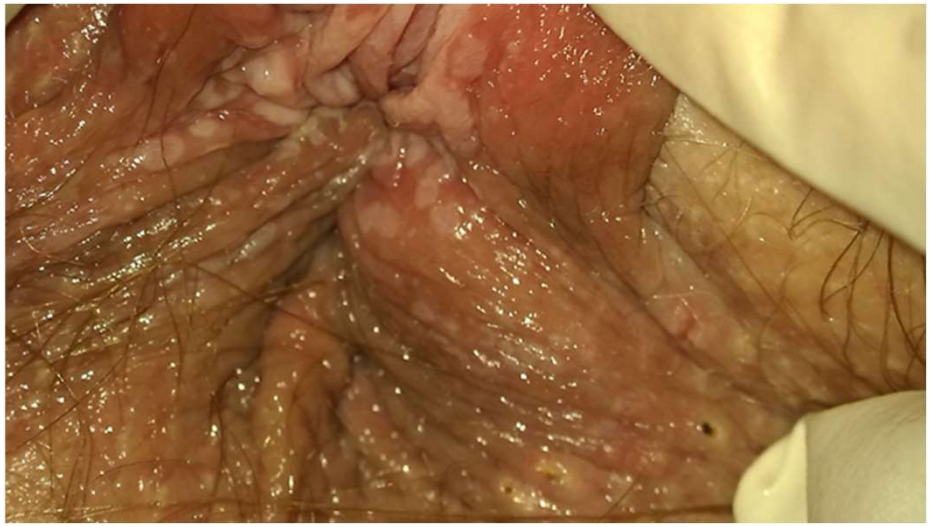
Definition of subclinical intra- or perianal warts:

Only visible after application of acetic acid 3%



Definition of clinical AGWs: Anogenital lesions

visible without application of acetic acid 3%

Histologically confirmed

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Table I. Prevalence and odds ratios (ORs) of clinical anogenital warts in renal transplant recipients and immunocompetent controls

	Men				Women			
			ORs of clinical AGWs				ORs of clinical AGWs	
Anogenital site[a]	RTRs (n=124) n (%)	Controls (n=125) n (%)	Model 1[c] OR (95% CI)	Model 2[d] OR (95% CI)	RTRs (n=124) n (%)	Controls (n=125) n (%)	Model 1[c] OR (95% CI)	Model 2[d] OR (95% CI)
Intra-anal	4 (3.2)	8 (6.4)	0.47 (0.14–1.62)	0.31 (0.07–1.32)	11 (8.9)	9 (7.2)	1.26 (0.49–3.22)	1.04 (0.38–2.87)
Perianal	8 (6.5)	2 (1.6)	4.42 (0.92–21.39)	4.41 (0.82–23.64)	9 (7.3)	1 (0.8)	9.85 (1.21–80.32)	7.49 (0.89–63.35)
Vulvar	Not applicable				7 (5.6)	1 (0.8)	9.39 (1.11–79.76)	9.35 (1.06–82.67)
Penile	2 (1.6)	1 (0.8)	2.04 (0.18–22.87)	1.80 (0.15–20.58)	Not applicable			
Any external clinical AGWs[b]	10 (8.1)	2 (1.6)	5.45 (1.17–25.46)	5.09 (1.03–25.04)	14 (11.3)	2 (1.6)	8.94 (1.94–41.14)	8.09 (1.69–38.82)
Any clinical AGWs	14 (11.3)	10 (8.0)	1.45 (0.62–3.41)	1.27 (0.49–3.28)	21 (16.9)	11 (8.8)	2.10 (0.95–4.62)	1.94 (0.86–4.37)

[a]Numbers for separate sites may not sum to total, because some participants had AGWs at more than 1 site. [b]Includes perianal, vulvar and penile clinical anogenital warts (AGWs). [c]Adjusted for age; with immunocompetent controls as the reference group. [d]Adjusted for age, smoking, lifetime number of sexual partners and (except in models for penile and vulvar warts) receptive anal sex.
95% CI: 95% confidence interval; OR: odds ratio, RTRs: renal transplant recipients.

- Prevalence of subclinical perianal warts: men (KTRs 9.7% vs controls 8.8%) and women (KTRs 6.5% vs controls 5.6%).
- Only a few participants had subclinical intra-anal warts (1.6% of KTRs vs 0.4% of controls)

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Consequence……

KTRs/SOTRs attending regular screening for cutaneous (pre-) cancer lesions at Departments of Dermatology in Denmark are now offered inspection of the external anogenital area for warts

Project overview

Registry-based study

Risk of genital warts

Risk of cervical-, vulvar-, vaginal-, penile- and anal precancerous lesions and cancer

Clinical study

Kidney transplant recipients

Prevalence and risk of anogenital warts

Prevalence and risk of anal HPV infection

Prevalence and risk of anal HSIL

Prevalence of cervical HPV infection and risk of anal co-infektion

› Clin Infect Dis. 2022 Nov 30;75(11):1993-1999. doi: 10.1093/cid/ciac285.

Anal Human Papillomavirus Infection in Kidney Transplant Recipients Compared With Immunocompetent Controls

Helle Kiellberg Larsen [1 2], Susanne K Kjaer [1 3], Merete Haedersdal [2], Alexander K Kjaer [1], Jesper Hansen Bonde [4], Søren Schwartz Sørensen [5], Louise T Thomsen [1]

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	Male KTRs vs. male controls		Female KTRs vs. female controls	
	Prevalence,	OR[1] (95%CI)	Prevalence	OR[1] (95%CI)
Anal hrHPV[2]	19.4% vs. 23.6%	0.85 (0.44–1.64)	45.5% vs. 27.2%	2.87 (1.57–5.22)

[1]Adjusted for age (linear), lifetime number of sexual partners (linear), current smoking (yes/no) and receptive anal sex (ever/never) with immunocompetent controls as the reference group

[2]INNO-LiPA® HPV Genotyping Extra II assay (Fujirebio). HPV types 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59 and 68 were considered hrHPV types.

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HPV-51 was the most prevalent hrHPV type in all 4 groups.
HPV-16 was found in approximately 16%–17% of the hrHPV-positive KTRs and 24%–29% of the hrHPV-positive controls.

Among hrHPV positive KTRs, 63% and 52% of men and women, respectively, were infected with hrHPV types covered by the nonavalent HPV vaccine (16/18/31/33/45/52/58).

› Transpl Infect Dis. 2023 Apr;25(2):e14019. doi: 10.1111/tid.14019. Epub 2023 Feb 7.

Prevalence of cervical human papillomavirus and the risk of anal co-infection in kidney transplant recipients: Results from a Danish clinical study

Linea Landgrebe Ring [1], Louise T Thomsen [1], Merete Haedersdal [2], Søren Schwartz Sørensen [3], Jesper Hansen Bonde [4], Trine Thorborg Lok [4], Helle K Larsen [2], Susanne K Kjaer [1 5]

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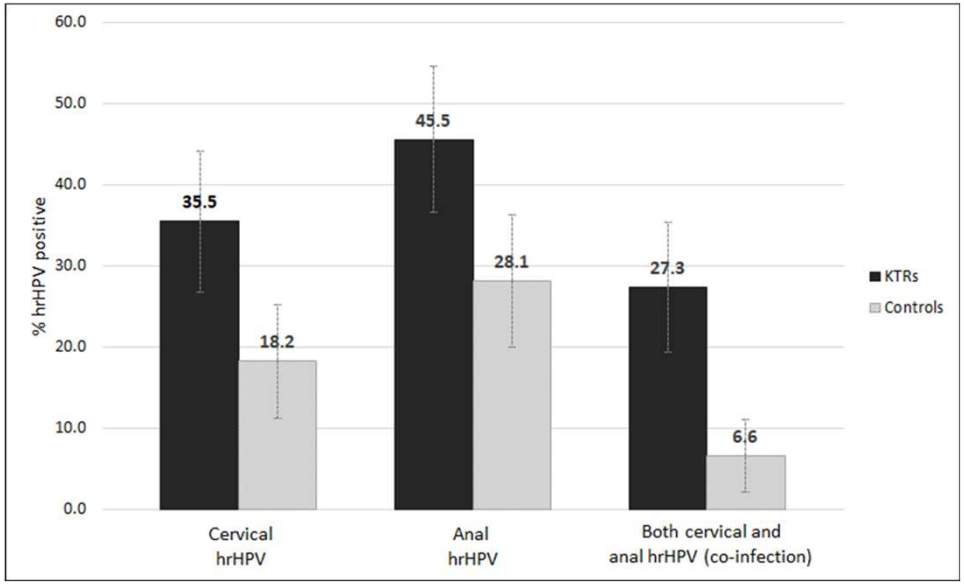
Table 3. Prevalence and odds ratio of cervical and anal hrHPV co-infection in Danish kidney transplant recipients and immunocompetent controls, 2016–2017.

Group	N	n (%) with cervical and anal hrHPV co-infection		Model 1[a] OR	Model 1[a] (95% CI)	Model 2[b] OR	Model 2[b] (95% CI)
Controls	121	8	(27.3)	1	(ref)	1	(ref)
KTRs	121	33	(6.6)	5.7	(2.5–13.3)	6.3	(2.7–15.0)

CI, confidence interval; hrHPV, high-risk human papillomavirus; OR, odds ratio; KTR, kidney transplant recipient.
[a]Adjusted for age (linear).
[b]Adjusted for age (linear), lifetime number of sexual partners (linear), current smoking (yes/no) and history of receptive anal sex (yes/no).



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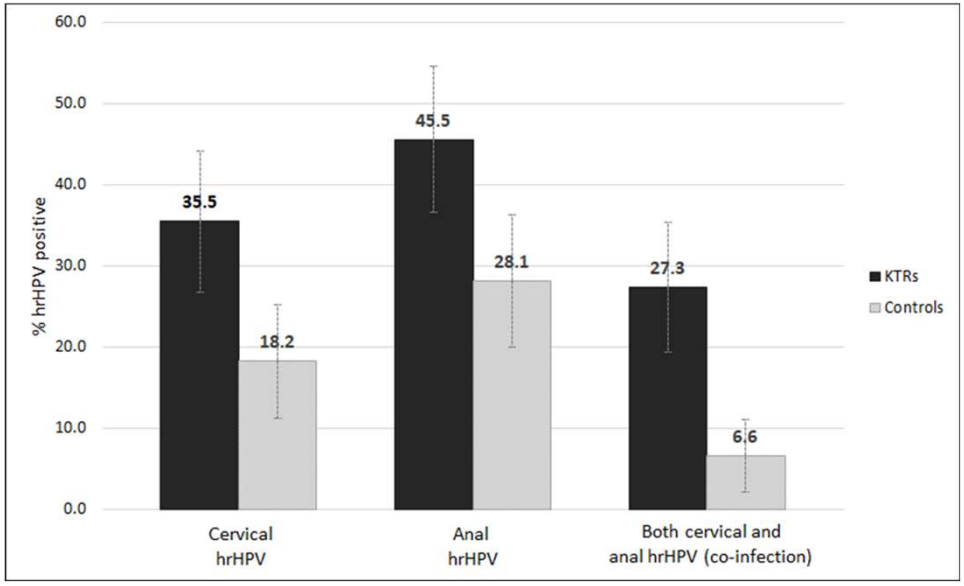
30.3% (10/33) had the exact same HPV types detected at both sites;
33.3% (11/33) had both concordant and discordant HPV types on the cervix and anus; and
36.4% (12/33) did not have any of the same HPV types detected at the two sites



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Prevalence and risk of anal HSIL

Prevalence of cervical HPV infection and risk of anal co-infektion

› Int J Cancer. 2020 May 1;146(9):2413-2422. doi: 10.1002/ijc.32565. Epub 2019 Aug 2.

Human papillomavirus-related anogenital premalignancies and cancer in renal transplant recipients: A Danish nationwide, registry-based cohort study

Kristian Reinholdt [1], Louise T Thomsen [1], Christian Dehlendorff [2], Helle K Larsen [1 3], Søren S Sørensen [4], Merete Haedersdal [3], Susanne K Kjaer [1 5]

Table 2. Hazard ratio (HR) of HPV-related anogenital intraepithelial neoplasia grade 2/3 or cancer in Danish female renal transplant recipients (1990–2015) *vs.* a nontransplanted comparison cohort (non-RTRs)

	Intraepithelial neoplasia grades 2/3						Cancer					
Anogenital site	**Person-years**	**Events**	**HR¹**	**(95% CI)**	**HR²**	**(95% CI)**	**Person-years**	**Events**	**HR¹**	**(95% CI)**	**HR²**	**(95% CI)**
Cervical												
Non-RTRs	910,648	1,542	1	(ref)	1	(ref)	964,349	211	1	(ref)	1	(ref)
RTRs	14,017	59	2.1	(1.7–2.8)	2.1	(1.7–2.8)	15,055	9	2.8	(1.4–5.4)	2.7	(1.4–5.3)
Vaginal												
Non-RTRs	964,071	14	1	(ref)	1	(ref)	964,349	15	1	(ref)	1	(ref)
RTRs	15,009	7	32.7	(13.1–81.6)	35.0	(13.9–87.7)	15,055	<5	11.1	(2.5–49.4)	10.7	(2.4–47.9)
Vulvar												
Non-RTRs	963,032	92	1	(ref)	1	(ref)	964,349	20	1	(ref)	1	(ref)
RTRs	14,936	24	16.8	(10.7–26.4)	16.4	(10.4–25.8)	15,055	8	31.7	(13.7–73.4)	31.0	(13.3–72.0)
Anal												
Non-RTRs	964,019	26	1	(ref)	1	(ref)	964,349	38	1	(ref)	1	(ref)
RTRs	14,991	19	48.8	(26.9–88.8)	51.1	(28.0–93.1)	15,055	5	10.0	(3.9–25.4)	10.4	(4.1–26.5)

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	Intraepithelial neoplasia grades 2/3						Cancer					
Anogenital site	**Person-years**	**Events**	**HR[1]**	**(95% CI)**	**HR[2]**	**(95% CI)**	**Person-years**	**Events**	**HR[1]**	**(95% CI)**	**HR[2]**	**(95% CI)**
Penile												
Non-RTRs	1,608,284	36	1	(ref)	1	(ref)	1,608,628	52	1		1	
RTRs	25,469	11	22.7	(11.5–45.0)	21.9	(11.1–43.5)	25,531	6	9.5	(4.1–22.3)	9.6	(4.1–22.4)
Anal												
Non-RTRs	1,608,542	14	1	(ref)	1	(ref)	1,608,628	31	1		1	
RTRs	25,491	9	38.9	(16.7–90.6)	39.0	(16.7–91.1)	25,531	0	NA		NA	
Penile/anal combined												
Non-RTRs	1,608,198	50	1	(ref)	1	(ref)	1,608,628	83	1		1	
RTRs	25,429	20	27.7	(16.4–46.9)	26.9	(15.9–45.5)	25,531	6	5.6	(2.4–12.9)	5.6	(2.4–12.9)

[1]Adjusted for age at baseline.
[2]Adjusted for age at baseline, income and educational level.

› Clin Infect Dis. 2021 Jul 1;73(1):21-29. doi: 10.1093/cid/ciaa781.

Risk of Anal High-grade Squamous Intraepithelial Lesions Among Renal Transplant Recipients Compared With Immunocompetent Controls

Helle K Larsen [1 2], Merete Hædersdal [2], Louise T Thomsen [1], Rasmus Hertzum-Larsen [1], Trine Thorborg Lok [3], Jesper Bonde [3], Søren S Sørensen [4], Jesper Melchior Hansen [5], Joel M Palefsky [6], Susanne K Kjær [1 7]

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Odds ratios of anal HSIL in kidney transplant recipients compared with controls

	total study population		Anal high-risk HPV positive participants	
	n(%) anal HSIL	OR* (95% CI)	n(%) anal HSIL	OR* (95% CI)
Men				
controls	(0.8)	1 (ref)	(3.4)	1 (ref)
KTRs	(6.5)	11.21 (1.46–291.17)	(33.3)	14.84 (1.65–438.24)
Women				
Controls	(4.0)	1 (ref)	(14.7)	1 (ref)
KTRs	(15.4)	6.41 (2.14–24.10)	(33.9)	4.58 (1.36–18.85)

*Adjusted for age, smoking, lifetime number of sexual partners and receptive anal sex.

CI, confidence interval, HSIL, high-grade intraepithelial lesion; OR, odds ratio; KTR, kidney transplant recipient

Anal HSIL was exclusively found in anal hrHPV positive KTRs and controls

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HPV 16 and anal HSIL:

Prevalence of aHSIL in individuals with HPV16 infection:

53.8% (7/13) in KTRs versus 29.4% (5/17) in controls (p=0.26).

For other hrHPV types than HPV16, the corresponding prevalences of aHSIL were

29.9% (20/67) in KTRs versus 2.2% (1/46) in controls (p<0.001).

› Acta Derm Venereol. 2021 Jul 13;101(7):adv00497. doi: 10.2340/00015555-3858.

Risk of Anogenital Warts in Renal Transplant Recipients Compared with Immunocompetent Controls: A Cross-sectional Clinical Study

Helle K Larsen [1], Louise T Thomsen, Merete Hædersdal, Trine Thorborg Lok, Jesper Melchior Hansen, Søren Schwartz Sørensen, Susanne K Kjær

› Clin Infect Dis. 2021 Jul 1;73(1):21-29. doi: 10.1093/cid/ciaa781.

Risk of Anal High-grade Squamous Intraepithelial Lesions Among Renal Transplant Recipients Compared With Immunocompetent Controls

Helle K Larsen [1 2], Merete Hædersdal [2], Louise T Thomsen [1], Rasmus Hertzum-Larsen [1], Trine Thorborg Lok [3], Jesper Bonde [3], Søren S Sørensen [4], Jesper Melchior Hansen [5], Joel M Palefsky [6], Susanne K Kjær [1 7]

RISK FACTORS INTRA-/PERIANAL WARTS AND ANAL HSIL

RTRs	Intra-/perianal warts , OR[1] (95%CI)	Anal HSIL, OR[1] (95% CI)
Receptive anal sex	**2.60** (1.11-6.07)	**6.23** (2.23-19.08)
Number of lifetime sexual partners ≥ 10	1.90 (0.82-4.40)	3.04 (0.84-11.88)
Current smoking	**2.43** (1.10-5.39)	0.89 (0.22-2.89)
History of AGWs	1.04 (0.43-2.48)	**4.21** (1.53-11.48)
Anal hrHPV infection		_[2]

[1]Adjusted for age, sex, smoking, number of lifetime sexual partners and receptive anal sex.
[2]Fisher´s exact test: p<0.0001, OR not computable as there were no cases of anal HSIL in anal hrHPV negative RTRs

CASE 1 FROM THE KTR HPV/DYPLASIA PROJECT

- 36-year old female KTR, Kidney transplatation maj 2010
  Cause: Polycystic kidney disease
- Immunosuppressive treatment:
  - Prednisolon
  - Tacrolimus (prograf)
  - Mycophenolatmofetil

Clinical examnation 2016:

Verrucous lesion at the introitus

Histologically: Vulva HSIL-VIN3

Cervix: persistent infection with HPV 16

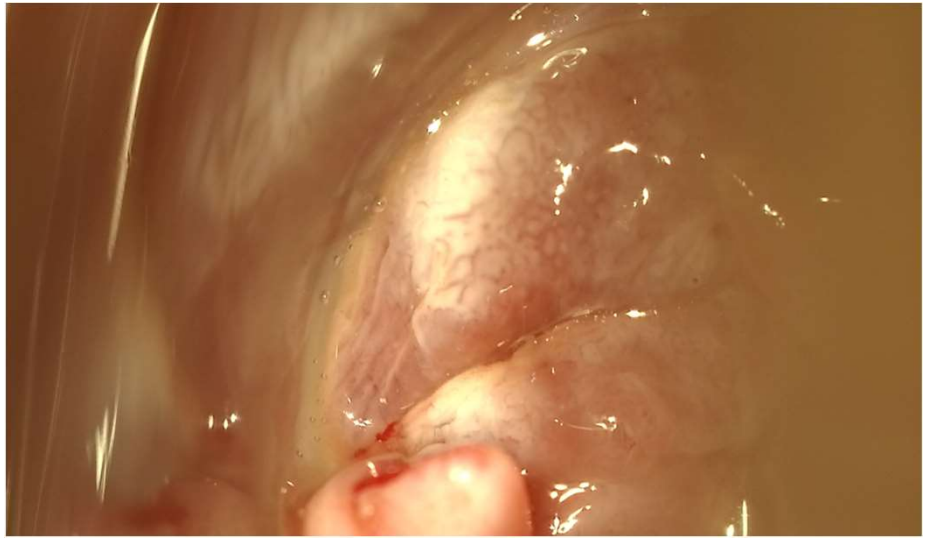
CASE 1 : ANAL FINDINGS

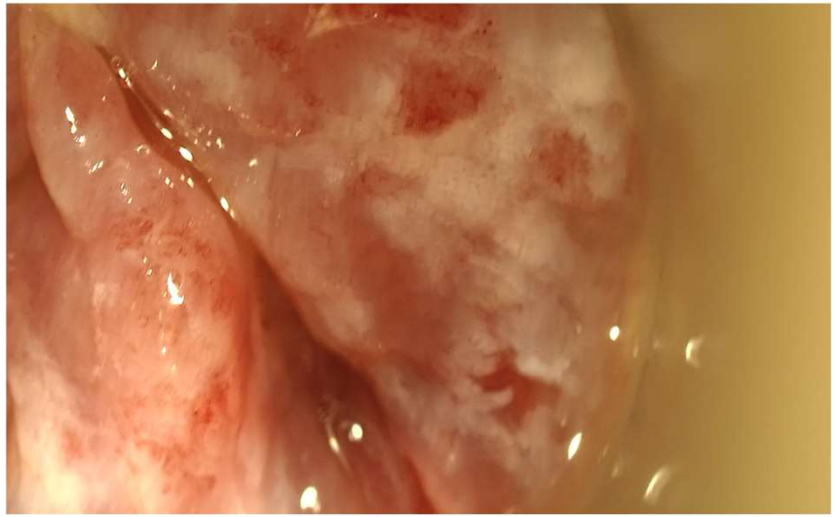
Anal cytology: ASC-H

Anal HPV testing: HPV 16

HRA: 9 o´clock mosaicism, 4 o´clock leucoplakia with punctuaion, erosive

Histology: Anal HSIL-AIN3 x 2



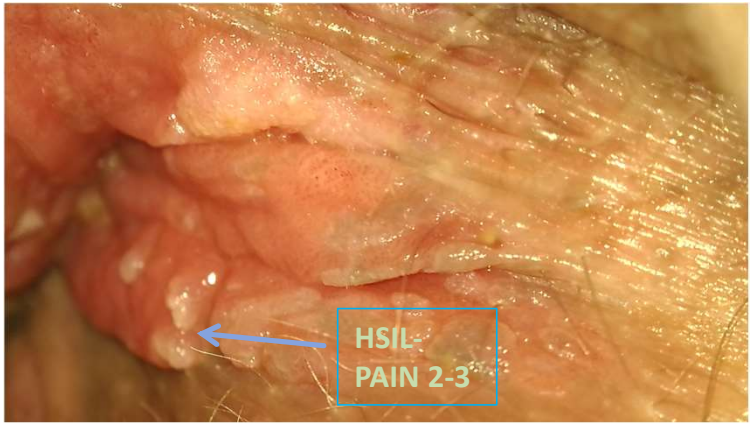


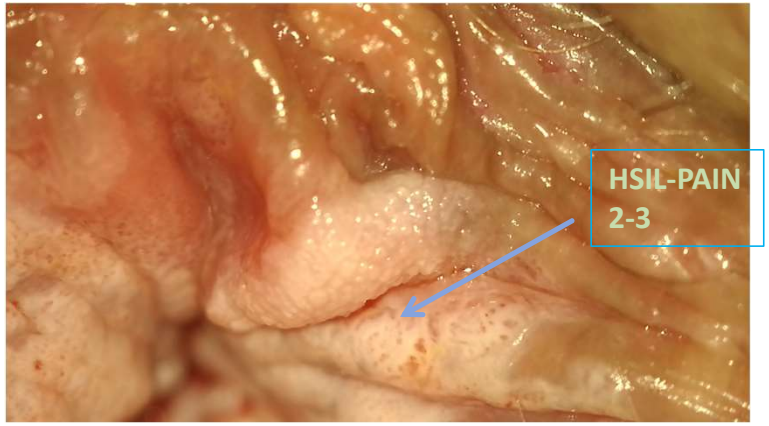
CASE 1 CONTINUED

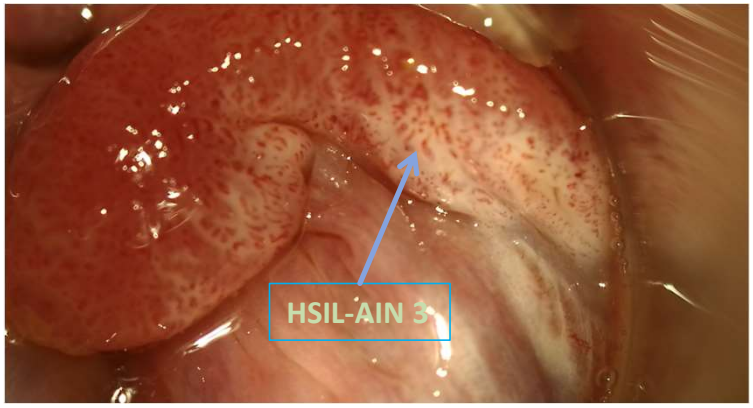
- Ongoing anal HSIL and
- From 2020 perianal HSIL
- Treatments
  - 5-FU, Imiquimod 5%, Trichloroacetic acid
  - Electrocautery x 5
  - From dec 2022 referred to department of Gastro-intestinal surgery
- September 2023 Perianal SCC

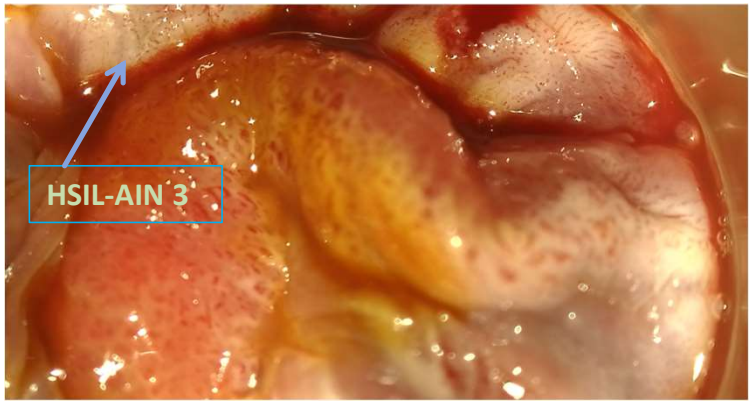
CASE II FROM THE KTR HPV/DYPLASIA PROJECT

71-YEAR OLD FEMALE KTR, ANAL CYTOLOGY: ASC-H, ANAL HPV: HPV 16



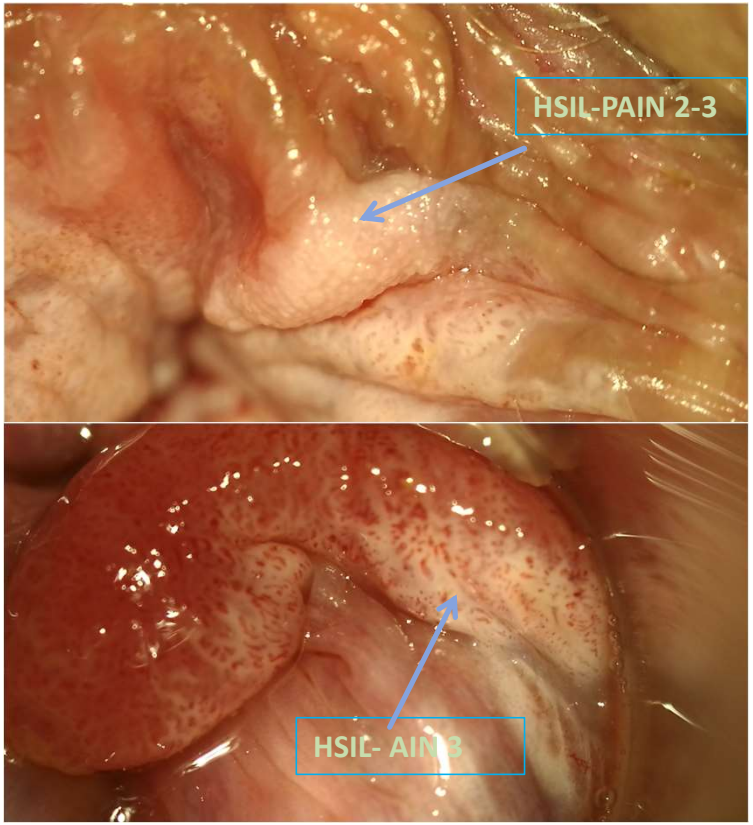




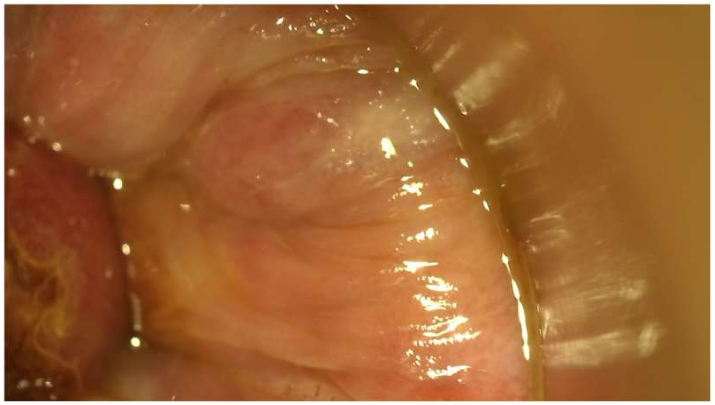


CASE 2 BEFORE AND AFTER TREATMENT

Before treatment



After treatment: electro cautery x many + surgical removal of polyp



CASE III 47-YEAR OLD KIDNEY TRANSPLANT RECIPIENT, REFERRED AFTER PERIANAL SCC X 2

Systemic Lupus Erythematosus since 2000
Kidney transplant: 2014

Perianal SCC x 2 ; August 2018 and January 2020.

CASE III CONTINUED

Histology:
Perianal:
12.07.2018 **HSIL** at 5-6 o´clock, hrHPV type 18 og 33
14.08.2018 SCC at 5-6 o´clock, free resectionborder, PET CT uden tegn til spredning. No indication for X-ray therapy
05.12.2018 **HSIL** at 3-5 o´clock, excision with el-diathermy
23.08-2019, **HSIL** at 4, 4-5, 6-7 and 7 o´clock
30-01-2020 SCC recurrence perianal at 5 o´clock. X-ray treatment 27/30 54 gy for T1 c ani
03.06.2020 **HSIL** at 4 and 8 o´cloco**.**
26.11.2021 og 10.03.2022 **HSIL** at 4 o´clock
16.06.2022 **HSIL** at 6 0´clock
03.10.2022 **HSIL** 5 and 7 o´clock
26.01.2023 **HSIL** at 5 o´clock
24.08.2023: **HSIL** at 7 o´clock
02.01.2024 **HSIL** at 5 o´clock, at 6-7 o´clock changes corresponding to HSV, confirmed on immunohistochemical staining
04.06.2024 **HSIL** at 3, 5-6 and 6 o´clock.
Analcanal:
19.12.2019 **HSIL** at 11 o´clock and LSIL at 8 o´clock.
29.09.2022 **HSIL** at 6 o´clock and probably **HSIL** at 8-9 o´clock
Vulva:
26.01.2023 Introitus **HSIL**
20.04.2023 **HSIL** lateral for lleft labia major
Cervix
2013 Conisatio: **CIN3**.
2020 hrHPV type 16 og 33 , normal cytology (februar 2020)

Treatments perianal/anal HSIL:

Aldara 5% x 3 weekly for 8 weeks only slight effect

5-FU only one week due to sideeffects.

Trichloroacetic acid 90% x many

Excision with diathermy dept of Surgery 16.06.2022 and sept 2022

Electrocautery x 4

Cryotherapy 2 x 20 sec 04.07.2024 og 3 x 10 sec 11.07.2024 followed by topical 5-FU x 5 weekly for 6+4 weeks with good result

CASE III CONTINUED BEFORE AND AFTER CRYO FOLLOWED BY TOPICAL 5-FU

CASE III CONTINUED ON DIALYSIS, ONLY STEROID TREATMENT CURRENTLY

Conclusions and Perspectives

- In a Danish population of kidney transplant recipients
  - **Increased prevalence and risk of anogenital warts compared to healthy controls were found**
  - **At Dermatological visits for skin cancer screening a full skin examination should include inspection of the anogenital area for anogenital warts**

- Be aware that Imiquimod stimulates the immunsystem, so close control with kidney function in KTRs and liver function i Liver transplant recipients is essential

Conclusions and Perspectives

- In a Danish population of kidney transplant recipients compared to healthy controls:
  - Increased prevalence and risk of anogenital warts
  - At Dermatological visits for skin cancer screening a full skin examination shall include inspection of the anogenital area for anogenital warts
  - **Higher prevalence and risk of anal hrHPV in female KTRs**
  - **For both male and female KTRs with anal hrHPV similar prevalence of anal HSIL (33%)**
  - **>50% of KTRs with anal HPV16 had anal HSIL and aprox. 30% of KTRs with other anal hrHPV than HPV 16 had anal HSIL**
  - **Anal hrHPV seems reasonable as a triage marker for HRA referral in KTRs**

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SPECIAL REPORT

IJC INTERNATIONAL JOURNAL of CANCER

International Anal Neoplasia Society's consensus guidelines for anal cancer screening

Elizabeth A. Stier[1] | Megan A. Clarke[2] | Ashish A. Deshmukh[3,4] | Nicolas Wentzensen[2] | Yuxin Liu[5] | I. Mary Poynten[6] | Eugenio Nelson Cavallari[7] | Valeria Fink[8] | Luis F. Barroso[9] | Gary M. Clifford[10] | Tamzin Cuming[11] | Stephen E. Goldstone[12] | Richard J. Hillman[6,13] | Isabela Rosa-Cunha[14] | Luciana La Rosa[15,16] | Joel M. Palefsky[17] | Rosalyn Plotzker[18] | Jennifer M. Roberts[19] | Naomi Jay[17]

TABLE 1 Populations for screening.

Population—Risk category	When	Anal cancer incidence[2,5] per 100,000 person-years
Risk Category A (incidence ≥ 10-fold compared to the general population)		
MSM and TW with HIV	Age 35	>70/100,000 age 30–44 >100/100,000 age 45+
Women with HIV	Age 45	>25/100,00 age 45+
MSW with HIV	Age 45	>40/100,000 age 45+
MSM and TW not with HIV	Age 45	>18/100,000 age 45–59 >34/100,000 age 60+
History of vulvar HSIL or cancer	Within 1 year of diagnosis	>40/100,000
Solid organ transplant recipient	10 years post-transplant	>25/100,000
Risk Category B (incidence up to 10-fold higher compared to the general population)		
Cervical/vaginal cancer	Shared decision age 45[a]	9/100,000
Cervical/vaginal HSIL	Shared decision age 45[a]	8/100,000
Perianal warts (male or female)	Shared decision age 45[a]	Unknown
Persistent cervical HPV 16 (>1 year)	Shared decision age 45[a]	Unknown
Other immunosuppression (e.g., Rheumatoid arthritis, Lupus, Crohn's, Ulcerative colitis, on systemic steroid therapy)	Shared decision age 45[a]	6/100,000
Incidence among the general population: 1.7 per 100,000[8]		

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"*In settings with limited HRA capacity, it is acceptable to only refer individuals testing positive for HPV16 to immediate HRA, with repeat testing in 12 months recommended for individuals testing positive for other hrHPV types. Repeat screening in 24 months is recommended for individuals testing hrHPV negative*".

Acknowlegdement

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Merete Hædersdal (professor, MD, DMSc.)
Benedikte Skov (research nurse)

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Expertise in dermatology and skin cancer in SOTRs.
Study design, funding, coordination, patient recruitment, data collection, publication.

Danish Cancer Society Research Center

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June 6-8, 2025

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