

DOES "GENITAL TRACHOMA" EXIST ?

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INTRODUCTION

The name of "genital trachoma" has been used for a long time¹⁾. Many ophthalmologists had already noted the existence of this condition, simply because some authors²⁾³⁾⁴⁾ claimed to have discovered the so-called trachoma bodies (*Prowazek-Halberstädter's* inclusion bodies) in the epithelium of mother's urethra or the cervical canal who had given birth to babies suffering from inclusion blennorrhoea. Some⁵⁾⁶⁾⁷⁾ succeeded in attempts to inoculate into the epithelia of the urethra or the cervical canal the materials containing inclusion bodies.

In Japan *Okamura et al*⁸⁾ also reported that two healthy women had been successfully inoculated in cervical canal with trachoma materials, and that after 220 days inclusion bodies had been demonstrated in the epithelia. Pathohistologically, they also found follicles, cellular infiltration and numerous inclusion bodies in its tissue which was about the same as that seen in trachoma. Therefore, they believe that the inclusion blennorrhoea is nothing more than a form of infantile trachoma.

Recently *Abu-Jaubeh*⁹⁾ supported the concept that the inclusion body represents a living virus of urogenital trachoma, on the basis that he could demonstrate the so-called inclusion bodies in 16 cases (14.2%) out of 112 trachomatous girls at Beirut.

More recently, *Pages et al*¹⁰⁾ have carried out large scale sampling from the mucosa of uterine cervix and these scrapings from female trachoma patients (42) showed in 22 cases out of 42, inclusions which on being stained with *Poleff's* stain were found to be morphologically identical with those of trachoma.

From these reports it would be thought that the hotbed of trachoma is closely related to urogenital parts of human body. Nevertheless, I have some doubts as to whether or not the etiologic cause of trachoma is the same as that of inclusion conjunctivitis in new-born child which caused infection in the birth canal of the mother. We strongly feel that it is imperative to know the relationship between the conjunctival and the genital trachoma.

MATERIALS AND METHODS

Over 1000 out-patients were selected at the Gynecological Clinic of Onoda

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Hospital in Yamaguchi Prefecture, where about 20 per cent of the population is suffering from trachoma. They were so selected that they had never used antibiotics or sulfonamide, for these drugs are effective against the inclusion bodies and other eye organisms to modify the results. No special attempts were made to assess the age, neither was the disease of gynecology considered.

The materials were obtained by scraping very gently the mucosa or pars vaginalis and pars cervicalis of uterus and urethra with *Cuscow's* curette (No.2) after washing with *Camelion's* solutions. The samples were then smeared directly upon the object glasses. They were examined by *Giemsa's* staining, *Poleff's* special staining¹¹⁾ and also by other methods. In this way, we could easily observe in the smears mucous epithelial cells and specific urogenital microorganisms as in the case of smears of the conjunctival sack.

The ages of the women ranged from 19 to 55, and about 95 percent of them were possibly pregnant. Clinical diagnosis of these women are given in Table I.

TABLE I. The gynecological diagnosis of patients

Clinical diagnosis	I group	II group	III group	Total
1 Pregnancy	236	84	200	530
2 Contraception	96	34	27	157
3 Abortion	31	30	18	79
4 Retroflexion of uterus	54	9	7	70
5 Diseases of vagina	20	8	6	34
6 Endometritis	12	7	11	30
7 Salpingitis	9	5	7	21
8 Cystitis	6	3	4	13
9 Metropathia hemorrhagica	3	2	4	9
10 Condyloma acuminata	1	6	0	7
11 Periurethritis	0	0	3	3
12 Barthrititis	0	2	0	2
13 Ulcus molle	1	0	0	1
14 normal	31	10	3	44
Total	500	200	300	1000

Table I shows the 3 groups: 500 cases belong to the first group in which pars vaginalis of uterus was studied; 200 cases (the second group) were investigated for pars cervicalis of uterus and 300 cases (the third group) for urethra.

In a separate survey, cervical part of uterus of two hundred pregnant women including those with serious trachoma of the eyes were examined histopathologically.

SMEAR TESTS

I have investigated 1000 cases by smear tests and the results obtained are summarized in Table II. The typical inclusion body was never found. Sometimes,

I found multiform granules resembling the inclusion body in the epithelial cells. However, these granules in the cytoplasm were definitely different from the true inclusion body as judged from our long experience in trachoma study. It is a very important and significant fact that not a single case with typical *Prowazek's* body was found, and that similar granules instead of *Prowazek's* body were demonstrated by *Poleff's* stainings method by means of citrated methylene blue.

There are so many kinds of organisms in such smears and they outnumber those of conjunctival organisms. The main species of bacteria in vaginal and cervical materials were *Veillonella*, *Comma* bacteria and *Döderleins* bacteria on the basis of relative frequency.

TABLE II. Smear test of urogenital organs

	Smear of pars vaginalis	Smear of pars cervicalis	Urethra	
			Moucosa	Smegma
Inclusion body	0	0	0	0
Analogous granule	21 (4.2%)	9 (4.5%)	91 (30.3%)	0
<i>Veillonella</i> bacteria	288 (57.6%)	95 (47.5%)	83 (27.6%)	55 (55%)
<i>Comma</i> bacteria	78 (15.6%)	24 (12.0%)	80 (26.6%)	5 (5.0%)
<i>Doederlein</i> bacteria	170 (34.0%)	34 (17.0%)	85 (28.3%)	18 (18%)
others		Sperma 7 (3.5%)		<i>Spirochaeta</i> 42 (42%) <i>Smegma</i> bact. 40 (40%)
Total	500 (100%)	200 (100%)	300 (100%)	100 (100%)

Table II represents the frequency of these organisms in the urogenital parts and in smegma. If we had investigated more carefully, the percentage of bacteria in this table would have been greater. It is an interesting finding that several kinds of microorganisms were found at the same time in most cases, but the main species constituted the greater portion of the organisms in number. We therefore presume that there is symbiosis among these organisms, but no relationship between the organisms in the urogenital organs and conjunctival sack.

All attempts to demonstrate inclusion bodies in the scraping materials from the urogenital have failed, nor have we been able to identify free elementary or initial bodies. The normal bacterial flora of the urogenitals are far more in number than the flora of the human conjunctiva, and we feel that these bacteria as has been previously mentioned were probably normal saprophytic forms. With the special staining technic by *Poleff*, similar analogous granules in mast cells and mucosa cells (cup cells) are mistaken as pathogenic bodies.

PATHOHISTOLOGICAL EXAMINATIONS OF CERVICAL CANALS

The histological examinations of the cervical canals were done in 200 biopsy materials. Histologically¹²⁾, the cervical epithelium is easily differentiated from that of the corpus in its relation to the subepithelial gland and stroma. The epithelium of the cervix is of two types. The epithelium of the pars vaginalis is similar to the stratified epithelium of the vagina, although the subepithelial papillae are much less marked. The epithelium of pars cervicalis extends to almost as far as the external orifice, but there are individual variations in its extension.

The epithelium of the endocervix is of an entirely different form. It is of tall cylindrical character (picket cell), much taller than that found in the endometrium, and it normally exhibits no cilia. The nuclei and cytoplasm are different in two epithelia. These differences in the epithelium of the corpus and the cervix are of great practical significance, because upon them is based the histogenic classification of carcinomas. Many former investigators believed that the inclusion body prefers cylindrical epithelium to stratified epithelium.

TABLE III. Pathohistological findings of cervical canals

Prowazek's Inclusion body	Diffuse cell infiltration	Follicular form of lymphoid cells	Mast cell	Trachomatous gland
0	160 (80%)	38 (19%)	200 (100%)	7 (7%)

Beneath the mucus membranes of the veering part of pars vaginalis and pars cervicalis were often found a follicular formation and diffuse cellular infiltration, which are called uterus trachomatous tissue figure. These pathological indications have no relationship with Prowazek's inclusion body, and typical inclusion body was never found in our studies.

As *Poleff*¹¹⁾ points out, his specific staining method is simple, rapid and yields perfect contrast for inclusion bodies which stain purple with a violet tinge, and their background takes a clear sky-blue color. However, his method may stain the mast cell granules and other intracellular granules like his trachoma bodies. These cell granules usually increase in the subepithelial tissue in inflammatory process.

Previously described pictures of trachoma transplanted uterus appear to be non-specific, for diffuse cellular infiltration in subepithelial tissue layer which looks like the forms of trachoma follicles and somewhat circumscribed collections of round cells are often seen in not-trachomatous individuals. Among 200 cases I found 160 cases (80%) with cell infiltration and 38 cases (19%) with follicular form of lymphoid cells, but there was no characteristic findings of trachoma. The gland of the cervix was found frequently to form retention cyst or tra-

chomagland-like structure (7%). The smear test of the urinary sediment and uro-genital epithelium of the mothers whose newborn infants suffered from inclusion conjunctivitis did not disclose Prowazek's body. (See Figs. 1-4.)

DISCUSSION

The results of these investigations seem to provide problems which need to be discussed:

1) We could not find the inclusions in smear tests among one thousand women in the *Onoda* district where the general incidence of trachoma is estimated to be about 20 per cent of the population. Therefore, there remains a great doubt whether the inclusion bodies have a relation to the hotbed of the urogenital trachoma or not. As regards the etiology of inclusion blennorrhœa in the new-born, it has been thought by some that the inclusion body causes infection in the birth canal of the mother, but the authors strongly doubt that the etiologic agent of trachoma is the same as pathogenic urogenital agents. Scarcely any urologists or gynecologists in Japan did ever note such condition due to inclusion body.

2) On the basis of our histological evidence, the inclusion body in the cervical canals of two hundred cases was negative, and the local changes in subepithelial layers were shown not to be specific in trachoma. Because, these round cell infiltrations and pseudofollicles were sometimes found in subepithelial tissues with cervical erosion. Dr. *Okamura* et al provided evidence in affirmation of trachoma, by discussing the relation of the Prowazek's body to the cervical erosion and inferring that the Prowazek's body occurs in the swollen, often infected cervical mucosa rolled out from the cervical ostium. In general, therefore, it appears that these changes of epithelial position are not specific and bear no relation to pregnancy.

3) In this investigation I used *Poleff's* staining and other classical methods. However, we failed to confirm the great advantages of *Poleff's* technic which was supported by recent French workers, for with this method nonspecific granules were easily demonstrated in the mucosa of human body. Formerly, a Japanese author¹⁵⁾ drew attention to the analogous bodies in the trachoma tissue as the possible pathogenic agent of trachoma, but we can not accept it now. *Abu-Jaube* reported the occurrence of inclusion bodies in the epithelium of urethral mucosa in 14 percent of trachoma patients at Beirut, and *Pages* et al stated that 50% of the patients examined showed in the mucous membrane cells of the uterine cervix inclusions morphologically identical with those of trachoma in Morocco. They used Dr. *Poleff's* staining method for the study, and therefore I have doubts as to their conclusion that they had demonstrated the inclusion bodies in the urogenital organs. It is very improbable that the cervical part of

uterus constitutes a hotbed of trachoma ¹³⁾¹⁴⁾.

SUMMARY

1. The smear test of the scraped epithelial cells was performed on the vaginal and cervical parts of uterus and urethra of the out-patients at a gynecological clinic in the rural area around Onoda where trachoma is found in about 20 per cent of the population. I could not find a single typical inclusion body, although sometimes as analogous body which looked like the inclusion body was demonstrated in or on the epithelial cells, and the meaning of such a body was discussed.

2. The histological observations with biopsy of cervical canals of 200 cases showed nonspecific characteristics of trachoma or inclusion body in epithelium.

3. The *Poleff's* contrast staining of trachoma body which was used by Abu-Jaubeh and Pages et al in their urogenital trachoma studies was proved unsuitable for this purpose, for with this technic granules of mast cells and of other origin can not be differentiated from the inclusion body.

Therefore, we could not establish any definite evidence of feminine urogenital disease caused by *Prowazek's* inclusion body.

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Fig. 1. Atypical follicular formation and diffuse cellular infiltration in pars cervicalis uteri. (Case No. 18, $\times 100$)

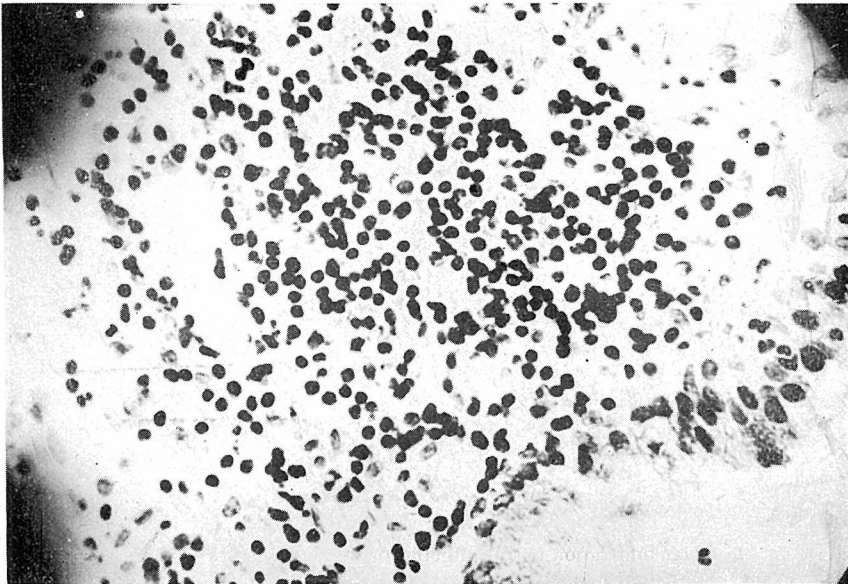


Fig. 2. Circumscribed collections of round cells in subepithelial tissue layer. (Case No. 18, $\times 450$)

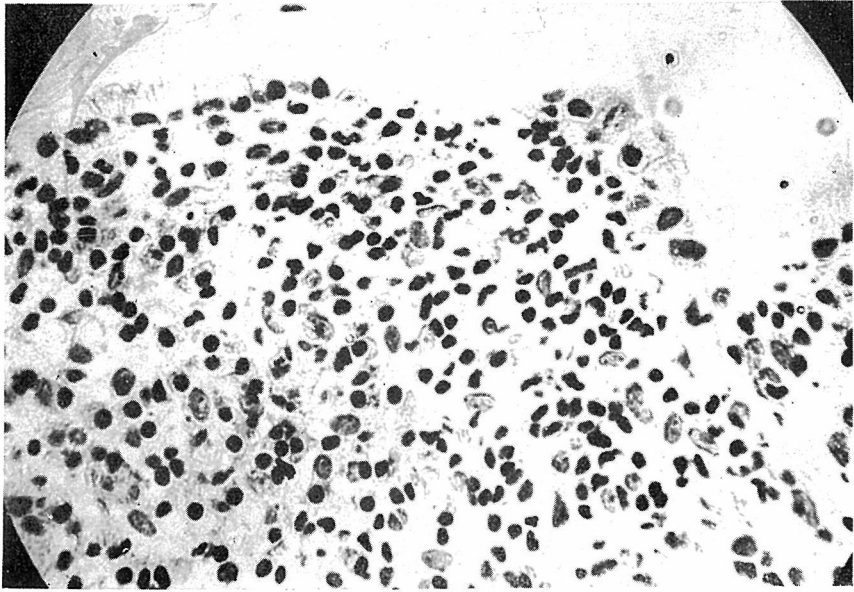


Fig. 3. Diffuse cellular infiltration in boundary of pars cervicalis and pars vaginalis. (Case No 46, $\times 450$)

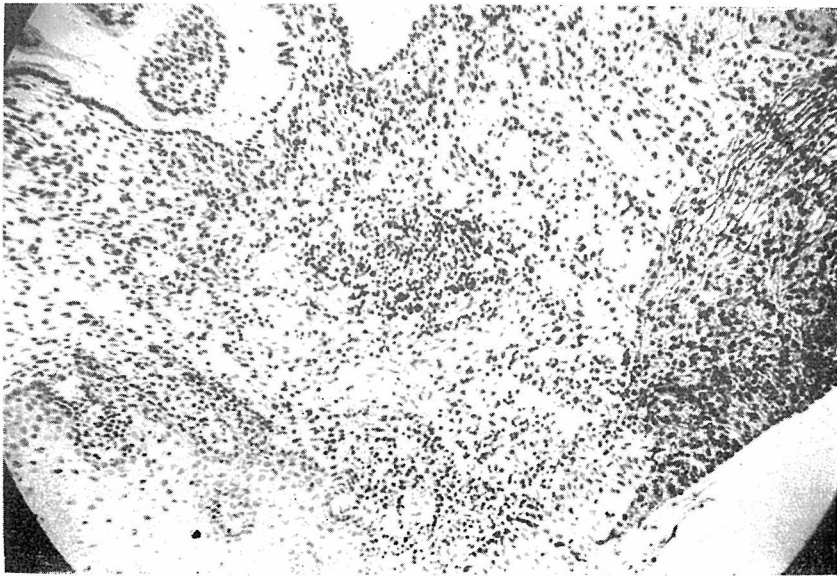


Fig. 4. Cellular infiltration in subepithelial tissue of pars cervicalis uteri. (Case No. 181, $\times 100$)