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Review

Body art and pregnancy

Nicolas Kluger *

Université Montpellier I, Service de Dermatologie, Hôpital Saint-Eloi, CHU de Montpellier 80 avenue Augustin Fliche, 34295 Montpellier Cedex 5, France

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ABSTRACT

Body art has gained tremendously in popularity over the past 20 years, and a substantial number of pregnant women may have tattoos or piercings. In most cases, pregnancy will be uneventful. However, on rare occasions, body art may become an issue or cause complications. Navel and abdominal surface piercing and microdermal implants may cause unsightly stretch marks from gravid distension. Nipple piercing could impair breastfeeding. In emergency situations, oral piercing may interfere with airway management and nasal jewelry can be inhaled or swallowed during orotracheal intubation. Tattoos may become distorted if placed on a distended area or they may cover surgical incision lines. The risk of introducing tattoo pigments during epidural analgesia, with the potential for tumor growth, is currently under debate, although the arguments are highly speculative and without solid basis.

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1. Introduction

Body modification (or "body alteration" or "body art") is the deliberate altering of the body for nonmedical reasons. Ear piercing, body piercing, and temporary or permanent tattooing are the most common types of body modification. Over the past 20 years, permanent tattooing and piercing have gained tremendously in popularity among almost all demographic groups. The group with the highest percentage of individuals having (or intending to have) a tattoo or piercing was born between 1977 and 1986, according to a recent study [1]. More than one third of the individuals with any form of body art (tattoos or piercings) are women [1]. There are thus a sizeable proportion of young future parturient women that have either piercings and/or tattoos. In most cases, pregnancy will be uneventful despite the body adornments. However, on rare—and perhaps underrecognized—occasions, body art may be a source of complications or issues during pregnancy. This review will focus only on the potential complications associated with pregnancy, delivery and lactation.

2. Body piercing

Body piercing is defined as the penetration of jewelry into openings made in the body [2–5], and piercing may be performed virtually anywhere on the skin surface. The body piercers usually decline to pierce the body of a parturient woman. It is therefore

* Tel.: +33 467 336 906; fax: +33 467 336 956.
E-mail address: nicolaskluger@yahoo.fr.

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unlikely that a physician will encounter a parturient woman with a complication from a recent piercing. The complications related to body piercing are divided into those that are site-independent (pain, bleeding, hematoma, migration, rejection, tissue tearing, keloid formation, granulomatous reaction, local or systemic infection) and those related to the piercing location (ear, helix, nose, etc.) [2–5]. A parturient woman with a piercing may therefore present with any of these complications. The locations that are specifically a matter of concern during pregnancy are mainly the navel, nipples and genitals.

2.1. Infection during pregnancy and body piercing

Local infection may occur during the piercing procedure or the healing phase, or later on as the piercing creates a permanent hole in the skin [2–5]. To date, there are no reports of an acute infection after a piercing procedure during pregnancy for the reason mentioned above. However, Jadhav et al. recently reported a case of chorioamnionitis with *Eikenella corrodens*, an oral commensal Gram-negative bacterium, in a 17-year-old parturient. Both the patient and her partner had tongue piercings and acknowledged frequent mutual oral sex during pregnancy. The authors of this report speculated on a potential contamination route related to the tongue piercing and cunnilingus [6].

2.2. Navel piercing

The navel is the most frequent site for piercing in women, after the ear [1]. As pregnancy causes great abdominal distension, navel piercing and piercing on the potential gravid distension site carry the risk of migration, rejection or striae/stretch mark development, as well as potential rejection of the jewelry. A navel ring may impede the growing uterus [7] and is therefore usually removed during pregnancy. However, despite its "prophylactic" removal, stretch marks may occur at the piercing site. This is most likely due to the stress rupture related to gravid distension [8, personal data]. Stretch marks from navel piercings are perhaps rare, given the frequency of this site among women [7]. Unfortunately, this complication is "more than skin deep" as women usually get this piercing in order to have a "sexy belly" and the remaining scar may be disabling from an aesthetic point of view [8, personal data]. Microdermal implants or "single point piercings" are a rising form of body art related to surface body piercing. They are slightly different, however, as the jewelry has two components: a flat plate (the "anchor") which sits beneath the skin with a single exit protruding from the surface of the surrounding skin, and the interchangeable jewelry, which seems to be screwed right into the body. This gives the appearance of being simply stuck on the skin surface [9,10]. The complications are close to those of "standard" body piercing, especially migration and rejection. However, we recently encountered young parturients with microdermal implants located on the abdomen [11]. The implants were either rejected or excised surgically because of the abdominal distension at the end of the pregnancies (Figs. 1 and 2). Young women and piercers should be aware of such complications and warned to avoid these locations for surface piercing.

2.3. Nipple piercing

Nipple piercing is infrequent [1,12]. Nipple piercing does not affect pregnancy and pregnancy does not affect nipple piercing [13]. The consequences are related specifically to breastfeeding. There are very few data on impaired lactation due to nipple piercing [13–16]. Experience seems to point toward the encouragement of breastfeeding despite piercing [13,15]. Aspiration of a part of the jewelry and trauma to the lips, tongue, gums or palate during sucking remains theoretical concerns, as no such complications have ever been reported [15]. Some authors nevertheless recommend removing the jewelry during breastfeeding. Milk may be ejected from the piercing tract and the nipple [15]. Scar tissue may constrict milk ducts and interfere with milk flow. Some lactating women may experience discomfort related to the heightened sensitivity of the pierced nipple during breastfeeding or an inhibited letdown reflex related to decreased sensitivity [15]. More recently, Garbin et al. noted that infants may be unsettled by breastfeeding from a pierced breast [16]. In addition, they observed difficulties in three lactating women while breastfeeding from the pierced breast, with reduced mammary blood flow and low milk production. However, it is likely that only a small proportion of women with a breast piercing would experience such difficulties [16].

Fig. 1. Spontaneous rejection of an abdominal microdermal implant in a parturient woman (with the courtesy of Dr. Sandrine Monestier, Hôpital de la Timone, Marseille) [10].

Fig. 2. Microdermal implant jewelry after surgical excision (with the courtesy of Dr. Sandrine Monestier, Hôpital de la Timone, Marseille) [10].

2.4. Genital piercing

As with nipple piercings, genital piercings are uncommon, but becoming more frequent [1,12,17–20]. Female genital piercings cover a wide range of type according to their location (clitoral hood, inner labia, outer labia, etc.). The most frequently reported purposes for acquiring a genital piercing include: sexual expres-

sion, sexual enhancement, and desire for uniqueness [17–20]. Delivery could be impeded, depending on the piercing [7]. To date, no specific report has dealt with complications in pregnancy from these piercings [15,20]. A recent survey of 240 women with genital piercing confirmed this trend, with 37 pregnancies without subsequent complications for either the patient or the infant [20]. Systematic removal of genital piercing is still controversial. For instance, in the case of cesarean section, genital piercings may be left. Careful perineal care is mandatory in cases of urinary catheterization [19]. Nevertheless, physicians and nurses should not lose sight of the fact that repeated removal-reinsertion increases the risk of local infection. Therefore, removal should always be questioned [19]. Moreover, patients who had to remove their piercings often reported feeling that they "had been ordered to remove them," without any attempt at dialog on the part of the health care providers concerning delivery plans [20]. A non-judgmental approach and careful wording are mandatory to increase compliance with suggested care [19]. "Guidelines" for nursing care and removal of genital piercing have been published elsewhere [19].

2.5. Oral jewelry and obstetrical anesthesia

Oral and nasal jewelry is of particular concern for the anesthesiologist because of the risks of swallowing and aspiration [21]. Kuczkowski and Benumof [22] reported that oral jewelry may interfere with airway management in the parturient woman. Postpartum hemorrhage prompted the emergency evacuation of retained fragments of placenta. The parturient had a tongue barbell, but there was not enough time to remove the jewelry before the general anesthesia. Orotracheal intubation was successful but laryngoscopy caused significant bleeding from the pierced surface of the tongue and tongue edema was noted at extubation. Thus, oral piercing can induce tongue and pharyngeal edema that might lead to airway obstruction [22]. The removal of oral jewelry before vaginal delivery or cesarean section has been debated, and the same question arises for nasal piercing, as nasal jewelry could be inhaled or swallowed during emergency orotracheal intubation [23]. It seems advisable to recommend jewelry removal before any surgical procedure, as there is no guarantee that a planned local or regional anesthesia will remain so and emergency airway management may become necessary [22]. Therefore, parturients should be asked at the beginning of their pregnancy whether they have piercings. Moreover, anesthesiologists should know how to remove them in case of emergency [24].

3. Tattoos

Tattooing is totally different from body piercing. It is characterized by the introduction of exogenous pigments and/or dyes to obtain a permanent design. As for piercing, a serious body artist will not perform a tattoo on a parturient woman. Moreover, a tattoo session may last several hours, depending on the tattooist's and the customer's stamina, and a parturient would not be able to lie still for several hours without obvious consequences. The American Pregnancy Association discourages pregnant women from having tattoos applied during this period [25]. However, it is likely that some women will be tattooed at the very beginning of pregnancy, while they are still unaware of their condition. There are no convincing data on the toxicity of tattoo pigments and dyes for fetal development, especially during the first 12 weeks [25].

Cutaneous complications related to tattoos include infections that can occur days to months after the procedure; hypersensitivity reaction to tattoo pigments such as eczematous, lichenoid, or granulomatous reactions and pseudolymphoma; localization of various chronic dermatoses on the tattoo; and the development of benign or malignant cutaneous lesions [26,27]. Such complications may naturally occur in any patient, pregnant or not.

3.1. Tattoo distortion and stretch marks during pregnancy

A few complications from tattoos are specifically related to pregnancy. These include the well-known risk of tattoo distortion due to skin distension. A tattoo applied to the abdomen or breast is more likely to become deformed because of gravid distension. Stretch marks may also occur on the tattoo site [9]. Tattooists and female customers are usually well aware of this risk when choosing the tattoo site.

3.2. Tattoos in the operative field of obstetrics

Interestingly, some patients may have a tattoo to camouflage postoperative scars; for example, following abdominoplasty [28]. However, another emerging issue with tattoos is their management when they are located in an operative site [29]. For instance, one can imagine the challenge to an obstetrician having to incise through an abdominal tattoo for a cesarean section. Fortunately, these situations are likely to remain theoretical or at least rare, as only 13% of tattooed women have abdominal tattoos [1]. A flowchart was recently proposed for the management of tattoos located on surgical incision lines and it was recommended that the patient determine the value of the tattoo preoperatively [29].

3.3. Lumbar tattoos and epidural analgesia

Lumbar tattoos have been the subject of numerous publications in the obstetric anesthesia field for the past 8 years (Fig. 3) [21,30]. Douglas and Swenerton warned about a potential risk of epidermal tissue coring and pigment introduction in the epidural space, with a theoretical risk of epidermal tumors or arachnoiditis [30]. Since then, some anesthesiologists have suggested—as a precautionary principle—the avoidance of epidural analgesia [16,30–33]. This has been a source of concern to young women with lumbar tattoos, who fear being refused an epidural analgesia. Moreover, there is an obvious lack of consensus among anesthesiologists, as observed in the Languedoc-Roussillon region in the south of France. According to a personal study, 57% of obstetrical anesthesiologists would perform an epidural analgesia through a tattoo, and 58% of them would do so without taking any specific precautions (i.e., prior skin incision) [34].

But, what do we really know thus far? First, there are no reports of complication after puncturing a lumbar tattoo. Only one case of painful reaction was reported after epidural analgesia, but the link with tattoo pigment migration remains highly speculative [31,35]. In fact, lumbar tattoos thus far seem to be a matter of concern only for obstetrical anesthesiologists. Neither neurologists nor rheumatologists—who may have to perform lumbar punctures—have published any guidelines for precautions to be taken regarding this site. Moreover, Douglas and Swenerton referred to publications from the 50s, when epidermal tumors were reported in children after lumbar puncture [36]. We should not forget that anesthetic techniques have advanced greatly since the 50s, and to date there have been no reports of epidermal tumor after neuraxial blocks [37]. Second, the recent data are reassuring about the risk of epidermal tissue coring and epidermal tumor during epidural analgesia [37,38]. Last but not least, tattoo pigments are located only in the dermis, mainly in macrophages and fibroblasts with some free pigments between collagen bundles, and the epidermis remains devoid of tattoo pigments. Therefore, epidermal tissue coring simply cannot contain any pigment [39–41] and dermal tissue coring was not observed after neuraxial blocks [37]. In the

Fig. 3. Lumbar tattoo in a parturient woman (with the courtesy of Dr. Jean-Christian Sleth, Polyclinique Saint-Roch, Montpellier).

Fig. 4. Epidural analgesia performed through the tattoo (with the courtesy of Dr. Jean-Christian Sleth, Polyclinique Saint-Roch, Montpellier).

rare event that the tattoo cannot be avoided by the puncture, we therefore strongly suggest that the anesthesiologist perform a neuraxial blockade *through* the tattoo (Fig. 4).

4. Conclusion

Body art is increasingly encountered in our daily practice. In most cases, tattoos and piercings will not interfere with pregnancy. In rare situations, they may be the source of complications or issues during pregnancy, delivery or lactation. Obstetricians should be aware of these potential consequences and be prepared to deliver comprehensive information to parturient women, who sometimes feel anxious—and perhaps even guilty—about bearing a body adornment. Lastly, body adornments are associated with negative stereotypes and negative attitudes may impact patient care. These patients therefore should be approached with a caring, non-judgmental attitude to avoid any impact on patient management [42].

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Conflict of interest

None declared.

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