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Male Circumcision: Integrating Tradition and Medical Evidence

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Male circumcision is the oldest known human surgical procedure, with historical records and archeological evidence dating the practice back to ancient Egyptians in the 23rd century BCE [1]. In Israel, neonatal male circumcision is routine practice. According to Jewish law, circumcision is the physical representation of the covenant between God and Abraham described in the Old Testament and is required for the inclusion of males in the Jewish faith. Newborn boys are circumcised in a traditional ceremony called a *brit milah*, where the foreskin of the penis is removed by a religious figure, known as a *mohel*, on the 8th day after birth. Most *mohelim* are not medically trained, although training and certification is available through the Israel Ministry of Health [2]. The procedure is performed as a celebratory event, in clean but not sterile conditions, and often in the presence of family and friends.

In this issue of *IMAJ*, Dr. Naimer [3] documents the case of an 8 day old new-born who experienced bleeding complications from a routine traditional circumcision and subsequently received surgical treatment at a nearby hospital. After successfully resolving the bleeding, the surgeon performed a skin graft. Dr. Naimer notes that the skin graft resulted in a scar on the groin of the patient, and argues that while the initial surgery to address the bleeding was potentially life-saving, the additional procedure was unnecessary and negligent.

Neonatal male circumcision is generally a safe procedure, with an overall complication rate in Israel of just 0.34% [2]. However, as with any other surgery, patients do experience some risk. The complication documented by Dr. Naimer is one such rare instance. Complications from male circumcision are usually minor, often involving bleeding, oozing, or local infection, and are almost always correctable [2,4].

In Israel, the number of neonatal circumcisions performed as medical procedures using local anesthesia is increasing [2]. A prospective study of circumcision-related complications among male infants suggested that although adverse events were rare overall, complications were significantly more likely when procedures were performed by mohelim as ritual ceremonies than when they were performed as medical procedures [2].

Furthermore, while research in the United States, where neonatal circumcision is predominately performed as a medical procedure, has demonstrated that the risk of infant

urinary tract infections is more than tenfold lower among circumcised males than uncircumcised males [4], studies in Israel have reported the opposite trend. Risk of urinary tract infection among circumcised male neonates in Israel is more than threefold higher than among uncircumcised male neonates in the USA [5]. Further analysis attributed elevated infant UTI risk in Israel to the methods typically used during ritual circumcision procedures. Two studies found that as compared to male infants who had been circumcised by a physician, male infants who had been circumcised by a mohel were 2.8 and 4.3 times as likely to experience UTI, respectively [5,6]. The increased risk of UTI among males who undergo ritual circumcision may be related to the technique of achieving homeostasis during the procedure. Mohelim typically apply wrapped gauze dressings around the penile shaft, which may resist urine flow and lead to a UTI. These dressings may be retained for several hours, and it has been shown that UTI risk is positively correlated with the length of time that the dressings are worn [6]. During medical procedures, physicians use slight local pressure with calcium-sodium alginate fibers that disintegrate within hours. These findings strongly suggest that even though ritual methods are unlikely to cause adverse events, circumcisions are most safely and effectively performed as medical procedures.

Although in some settings the demand for circumcision is predominantly driven by religious, cultural, or aesthetic reasons, it has become clear in recent years that the procedure has long-term medical benefits. Three recent randomized trials in Africa demonstrated that medical circumcision reduces acquisition of human immunodeficiency virus among males by 51%–60% [7], genital herpes by 28–34% [8,9], and high risk human papillomavirus, which may lead to penile cancer, by 32–35% [10]. Long-term analysis has also suggested that these preventive benefits increase over time [11]. Females would also indirectly benefit from male circumcision through a reduced risk of transmission from their male partners [12]. A trial that assessed female benefits found that female partners of circumcised men had a reduced risk of bacterial vaginosis, *Trichomonas vaginalis* infection, and high risk human papillomavirus, which causes cervical cancer [13,14]. Male circumcision confers these medical benefits by removing HIV target cells (T cells and dendritic cells) that are found in the foreskin mucosa [15,16], and by removing the preputial cavity that can harbor bacteria and viruses that cause sexually transmitted infections [7,17].

Observational studies of male circumcision in the United States have demonstrated similar reductions in the incidence of sexually transmitted infections, suggesting that the efficacy estimates from these trials are applicable to contexts outside Africa [7,17,18]. Male circumcision has also been linked to other medical benefits, including a tenfold reduction in the risk of infant urinary tract infections [4] and possible reductions in the risk of chancroid, syphilis, phimosis and balanitis [19]. As a result of this compelling evidence, the World Health Organization and the Joint United Nations Programme on HIV/AIDS have recommended that voluntary medical male circumcision be incorporated as part of an HIV prevention strategy for regions with a high HIV incidence [20].

A recent analysis of the comprehensive financial and health implications of male circumcision in the U.S. has demonstrated that the procedure is a cost-saving intervention to reduce the incidence of infant male UTI and potential sexually transmitted infections among men and their female partners [21]. This economic evidence further supports the value of circumcision as an effective medical tool with broad social and health benefits.

In light of recent randomized trial evidence demonstrating that male circumcision has substantial health benefits for men and their female partners, it is clear that coordination between medical and religious communities would be valuable to address the religious and cultural interests of Jewish men while ensuring the safety and efficacy of an inherently medical procedure. Experience from sub-Saharan Africa in scaling up male circumcision

programs suggests that individuals without a previous medical background can be trained to successfully and efficiently perform the procedure. Therefore, effective programs to facilitate and regulate the medical training of mohelim in Israel may be especially valuable.

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Glossary

UTI	urinary tract infection
HIV	human immunodeficiency virus

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