

Alginate has been used in different biomedical applications such as drug delivery, protein delivery, wound dressing, cell culture, tissue engineering (blood vessels, bone, cartilage, muscle, nerve, pancreas, and liver), formation of dental impression materials, and gas preventive formulations. Cross-linked alginate (Na or Ca alginate) has been used to make an oral tablet because of its suitable gel formation property. This acceptable gel-forming ability of alginate permits to protect the different mild amalgams from acidic conditions inside the stomach by its buffering action [16, 17]. In this chapter, only the wound care application by using alginate has been elaborated in the next sections.

### 9.4.1 Alginate in Wound Care

Wound is a broken part of the skin due to some physical and thermal actions, as mentioned earlier. Wound can also be explained as the disruption of the normal anatomic activities of the cells in the presence of different actions (friction, temperature, etc.). It is mainly categorized into two types on the basis of wound repairing process, i.e., acute and chronic wounds. An acceptable wound management system is necessary to treat the wounds. Wound dressing is a biological process to regenerate and promote growth of cells and tissues. In the nineteenth century, synthetic or natural bandages, wool cotton, lint, and gauzes have been used in wound management applications because of their absorbance capability. The function of wound dressing is to protect the wound from infection by allowing evaporation of the exudates through the dressing and creating a barrier against different external harmful microorganisms [18]. Nowadays, wound could be healed in a better and successful manner by creating a warm, moist environment around the wound. Epithelial cells can be removed from the surface of the wound so that oxygen circulation around the wound area would increase. Therefore, regeneration of the cells and tissues will be improved in the presence of warm, moist environment [19]. Different factors, such as the type of wound, chemical and physical properties of the wound-dressing materials, and the condition of the patient in terms of health, influence the wound management process. Therefore, it is important to understand the all above-mentioned factors before starting the wound dressing process for a given type of wound. There are various natural carbohydrate-based materials like neutral (e.g., cellulose, dextran, and (1→3)- $\beta$ -D-glucans), basic (e.g., chitin and chitosan), acidic (e.g., alginic acid and hyaluronic acid), and sulfated polysaccharides (e.g., heparin, chondroitin, dermatan, and keratan sulfates) from which wound-dressing materials can be developed for wound care application. Among them, the alginate-based material has different advantages like