[??/??Technical complications The frequency of occurrences of technical complications is greater in implant–supported FPDs as compared to the implant–supported removable prosthesis.[48] Fracture of the framework Whenever there is a rigid connection between the osseointegrated implant and the fixed subsequent framework, the strains are inevitably induced in every component of the framework.[49] The additional functional load produces supplementary strains, which affect the bone–implant–prosthesis assembly.[50,51] Hence, the challenge remains for a prosthodontist to deliver a tolerable prosthesis that does not jeopardize the endurance of the treatment.[52,53] Therefore, passive fit of the framework has been advocated as a requirement for successful long–term osseointegration of the implant with the surrounding bone.[54,55,56] The problem of fracture of framework is reportedly exaggerated in partially edentulous jaws, because the implant–abutment interface and abutment retention screw are exposed to higher lateral bending loads, tipping, and elongation as compared to bilaterally splinted implants in a completely edentulous jaw.[57,58,59] The length of the cast bar or framework span is directly proportional to the construction–related distortion,[60] which could get worsened by nonparallel placement of dental implants.Refined approaches and detailed and accurate prosthodontic procedures are still a requisite to achieve a passive fit with an implant–supported superstructure.[66] Fracture of veneering porcelain Metal–ceramic restorations are the most common types of restorations in clinical dentistry.[67,68] With the passage of time, esthetic demands of the patients have risen and thus driven the clinicians to focus on all–ceramic restorations.[69] Zirconia restorations are promising, and the material is even being used to fabricate implant abutments for cement–retained restorations or for direct veneering for screw–retained prosthesis.[69] Fracture of the veneering ceramic is another common complication associated with single–implant restorations.[28,70,71] Sadid–Zadeh et al.[28] concluded that of a total of 5052 ceramic and porcelain fused to metal restorations, 172 failed due to chipping off, which makes it 3.4% of the complications associated, at a mean follow–up of 5 years.Peri–implantitis Biological failures include bacterial infections, microbial plaque buildup, progressive bone loss, and sensory disruptions.[72,73,74] Biological complications are subcategorized into early biological failures and late implant failures, where the early failures are attributed to the failure of placing the surgical implant under proper aseptic measures[74,75,76] and the late complications are typically peri–implantitis and infections bred by bacterial plaque.[77,78] Peri–implant disease is defined as the inflammatory pathological change that takes place in the soft and hard tissues surrounding an osseointegrated implant [Figures 2 and 3].[79] When an implant is successfully osseointegrated, the peri–implant disease that occurs is the consequence of disparity between the host defense and increasing bacterial load.[80] It usually takes about 5 years for the peri–implant disease to progress and exhibit clinical signs and symptoms.[73,74,81] The incidence of peri–implantitis and implant loss could be greater if the studies with longer follow–up periods are evaluated [??/??Fracture of the implant abutment screw can be a grim setback as the remaining fragment inside the implant jeopardizes the efficient functioning of the implant.[39,40] When patients wear an implant–supported prosthesis (fixed or removable), there is a decrease in the occlusal forces which ranges from 200 to 300 N.[41] The failure of implant abutments occurs when the lateral forces exceed 370 N for the abutments having the joint depth of at least 2.1 mm and 530 N with a joint depth of at least 5.5 mm.[42,43,44] Implants with a smaller diameter of 4 and 3.75

mm are inclined to fractures more easily than those with the greater diameter.[35,36,45] It has been reported that an implant having a diameter of 5 mm is three times stronger than the one with the diameter of 3.75 mm, while an implant of 6 mm diameter is 6 times stronger than a 3.75 mm implant.[46] The risk factors associated with implant components are categorized into three groups and are enumerated in Table 2.[37,39] Abutment screw fracture and loosening can be reduced if certain strategies are followed.Over the course of years, many manufacturers have revised the conventional implant components to reduce the incidents of screw loosening.[29,30] Screw/implant fracture There are two major causes of implant fracture: biomechanical overloading and peri-implant vertical bone loss.[31] The risk of implant fracture increases multifold when the vertical bone loss is severe enough to concur with the apical limit of the screw.[32,33,34] Implant fractures are also attributable to flaws in the designs and manufacturing of implant itself.[35,36] Unnoticed and recurrent screw loosening is a risk factor for dental implant fracture, which indicates change in the prosthesis design.[37] The most frequently encountered fracture is of the hexagonal head away from the main body of the screw.[38] When a screw is loose, it is more disposed to excessive sideward load.?] Rahaf...?: In a healthy environment around the implant, the tissues play a pivotal role in preventing the spread of agents that can be pathognomonic, and if the biological barrier is breached, it could lead to bacterial contamination around the bone resulting in hasty destruction of the tissues surrounding the implant.[83] The peri-implant disease is also related to unequal occlusal load distribution, which may lead to loosening of the superstructure, infection of the surrounding area, eventually culminating into the inflammatory process.[84] Predisposing systemic conditions include uncontrolled diabetes mellitus, osteoporosis, smoking, long-standing treatment with steroids, uncontrolled periodontitis, radiation therapy, and chemotherapeutics.[80,85,86] Table 3 enumerates clinical and radiographic symptoms that may be associated with peri-implant disease.Complications associated with dental implants[12,13] graphic file with name EJD-11-135-g001.jpg Open in a new tab Mechanical complications Mechanical complications are usually a sequel to biomechanical overloading.[15,16] Factors contributing to the biomechanical overloading are poor implant position/angulation [Figure 1] (cuspal inclination, implant inclination, horizontal offset of the implant, and apical offset of the implant),[17,18] insufficient posterior support (i.e., missing posterior teeth), and inadequate available bone or the presence of excessive forces due to the parafunctional habits, that is, bruxism.[18,19,20] Figure 1.Risk factors associated with dental implant fractures[37,39] graphic file with name EJD-11-135-g003.jpg Open in a new tab Cement failure Cement failure is another consequence of biomechanical overload, typically affects the prosthesis attachment and may be treated by recementation procedure.[21] With the advancements in material science, particularly for luting agents, the incidence of decementation has reduced significantly.[28] However, careful treatment planning and clinical criteria must be followed to avoid such incidences.In another follow-up study of Branemark single-tooth implants, screw loosening was reported to be the most frequent complication.[26] To ease the incidence of screw loosening, it is advised to maximize the joint clamping forces while curtailing joint separating forces.[27] Joint separating forces include excursive contacts, cantilevered contacts, interproximal contacts, off-axis centric contacts, and nonpassive frameworks.?:???:??[??/???:??